CONSERVATION

IN

SOUTH CENTRAL ONTARIO

DEPARTMENT OF PLANNING AND DEVELOPMENT

"Man cannot live by bread alone" but neither can he survive in his present form without it. The symptoms of spiritual revival in our age are among the most hopeful signs for the future, but the earthly habitat of man's spirit is his body, and the roots of his physical and mental well-being spring from the soil itself, whether the individual be town or country dweller.

—E. D. BALFOUR, The Living Soil.

Most of the Humber watershed was originally covered with sugar maple-beech forest of this type, but few woodlots have been maintained in as good condition as this one near Hammertown.

DEPARTMENT OF PLANNING AND DEVELOPMENT

Hon. Dana Porter, Minister

A. H. Richardson, Chief Conservation Engineer

CONSERVATION

IN

SOUTH CENTRAL ONTARIO

Papers and proceedings of the Conference on Conservation in South Central Ontario held at the Ontario Training and Re-establishment Institute, Toronto, November 29th and 30th, 1946.

ONTARIO

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DEPARTMENT OF PLANNING AND DEVELOPMENT

CONSERVATION BRANCH

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First edition—5,000 copies—1948

INTRODUCTION

At the request of the Community Councils Co-Ordinating Committee of the Toronto District, a Conference on Conservation in South Central Ontario was held at the Ontario Training and Re-establishment Institute, Toronto, on November 29th and 30th, 1946, by the Department of Planning and Development, in order to discuss problems connected with conservation on the Humber and Don Rivers. Invitations to attend the conference were sent to all the municipalities in the area, educationalists, government officials, engineers, etc., as well as executives of all organizations of the province interested in conservation. The registered attendance was approximately two hundred.

The Conference commenced on Friday, November 29th, at 2.00 p.m., the delegates being welcomed by Mr. A. H. Richardson, for the Honourable Dana Porter, Minister of the Department of Planning and Development, who was in Mexico at the time representing the Provincial Government at the inauguration of the President of that country. Professor R. F. Leggett was chairman of the first session, at which the following papers were presented: "Forests of the Humber" by A. S. L. Barnes, "The Don Valley System" by Dr. D. F. Putnam and L. G. Reeds, and "Soil Conservation Farming" by Professor G. N. Ruhnke.

At 6.30 p.m. a banquet was held in Simpson's Arcadian Court at which the guest speaker was the Honourable George A. Drew, K.C., Prime Minister of Ontario. The Prime Minister's address was followed by a tableau entitled "The Humber" presented by the 77th Toronto Troop of Boy Scouts, and the evening concluded with two excellent conservation films.

At the Saturday morning session, Mr. W. Austin Peters, President of the Ontario Federation of Anglers and Hunters, was chairman, and the following papers were presented: "A Land Use Survey on the Etobicoke Creek" by W. J. P. Creswick, "Fish Studies in Southern Ontario" by Dr. A. G. Huntsman, and "Conservation on the Farm Property" by M. A. Adamson.

At noon on Saturday a conference luncheon was held, with Mr. N. A. Fletcher, President of the Ontario Conservation and Reforestation Association, in the chair. Following the luncheon Mr. Fletcher outlined briefly the achievements of the O.C.R.A. since its inception in 1937, and Mr. W. H. Porter, Secretary of the O.C.R.A., presented a paper entitled "Europe is Telling Us".

Mr. Eric W. Baker, Chairman of the Community Councils Co-Ordinating Committee of the Toronto District, was chairman for the Saturday afternoon session at which the following papers were presented: "Regional Planning" by F. G. Gardiner, K.C., "Recreation on Forest Lands" by Professor J. L. Van Camp and "Recreation on the Humber" by K. M. Mayall.

The afternoon session closed with the presentation by the Resolutions Committee of seven resolutions, all of which were passed by the meeting and the text of which will be found at the end of this bulletin.

All the above papers, including those given at the Saturday noon luncheon, will be found in the body of this publication in the order in which they were given.

An interesting feature of the Conference was an inspection of approximately one hundred photographic enlargements, maps, bulletins and books, loaned by Government Departments and delegates. These were studied carefully by the delegates and helped to supplement the information which was presented by the various speakers.

—A.H.R.

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ADDRESS OF WELCOME

The Hon. Dana Porter

THIS conference has been called at the request of a number of organizations interested in the conservation of resources in the Humber Valley and the area generally extending around the City of Toronto. In view of the increasing interest that is being taken in questions of conservation of resources, it was considered advisable to constitute this as a meeting for those interested in Central Ontario. It will follow along similar lines to those pursued at the conference held in London in October, 1944, and the one later held at Kingston. Since those previous conferences, considerable work has been done by the Department of Planning and Development. A comprehensive conservation survey has been completed of twelve hundred square miles of the Thames Valley north of London. This has been followed by a four hundred page report released at the City of London on October 25th last. Surveys have also been carried out in the watersheds of the Etobicoke, the Humber and the South Nation. It is expected that reports will follow in due course.

At the 1946 session of the Legislature, the Conservation Authorities Act was passed. This Statute provides for the organization of conservation authorities with jurisdiction to formulate and carry out conservation schemes covering watershed areas. The membership of these authorities consists of representation from the municipalities of the area concerned. The Act gives powers to an authority necessary for the formulation of a scheme, the expropriation of land and the carrying out of works and the planting of trees that may be required to put a scheme into effect.

Authorities established to date under this Legislation are the Ganaraska, the Etobicoke and the Ausable.

The first scheme formulated under this Act was presented by the Ganaraska Authority on October 3rd, 1946. The scheme provided for reforestation in the Ganaraska Forest as recommended in the Ganaraska Report. (This Report was published in 1944. It was the work of a joint Committee of the Dominion Government, represented by the Advisory Committee on Reconstruction and the Provincial Government, represented by the Interdepartmental Committee on Conservation and Rehabilitation, Mr. A. H. Richardson, who played a leading part in the preparation of this Report is now the Chief Conservation Engineer, Department of Planning and Development.) The scheme that has been settled between the Authority and the Government provides for the reforestation and maintenance of the forest on land that may be acquired by the Authority on the area designated as the Ganaraska Forest. The Department of Lands and Forests is ready to enter into an agreement with the authority to provide the trees, to plant the trees, to maintain the forest, and to fence where necessary. The Government is ready to agree to pay half the cost of land that may be acquired for these purposes,

the Authority to raise the balance. The agreement is also to contain provisions which will give to the Authority an option to acquire ownership of the whole forest within a period of years on certain terms and conditions. The arrangement of the details of this agreement is still pending.

It is to be noted that the Ganaraska scheme is the first step in a conservation programme for the Ganaraska Valley. There, reforestation was the most important single item. The Authority decided to limit their first activities to a programme of reforestation. It will be free to make further proposals as and when it considers it advisable to do so.

The procedure available for carrying out a plan for the conservation of resources is,—

(1) To establish an authority;
(2) To make a comprehensive survey;
(3) To formulate a scheme;
(4) To settle with the Government the terms of financing and carrying out the scheme.

The foregoing outline indicates briefly the progress that has been made towards planning for conservation in the last few months. The Ganaraska scheme is an example of the steps that require to be taken and the means of reaching the objective.

On behalf of my Department, I wish to extend the most hearty welcome to the delegates who have gathered to discuss problems of conservation in South Central Ontario.

THE FORESTS OF THE HUMBER

A. S. L. Barnes
Department of Planning and Development

A MERE sixteen per cent, and a very poor sixteen per cent at that, of my subject remains to-day. The remnant is so small and the quality so low that the word forests is only justified by including in this talk a discussion of the forests as they were, as well as a statement concerning their present condition and a brief outline of recommendations for their improvement.

The practice of conservation in most countries is of very recent origin but prophecies of the evil consequences of indiscriminate wasting of resources were made years ago. Let me read you an extract from a book[1] written about Upper Canada in 1829:

> "Trees of various kinds are to be found thickly growing together for thousands of miles. That they serve to allay the severity of the climate, is surely one of the uses for which they are intended; it neither being so hot amongst the trees in summer, nor yet so cold in winter, as it is in the cleared country. In the former season, the rays of the sun are chiefly withheld from the soil by the leaves and branches; and in the latter, the cold which is generated in the atmosphere, is also prevented by them from darting down and freezing up the pores of the earth: they may, therefore, be said to act both as a shade and a covering. When the rain falls they imbibe and retain more cooling moisture than the land would do without them; hence the many springs we find in the woods. Perhaps the rivers and lakes will become affected differently if once these immense territories are shorn of their trees; some of them may dry up all together in summer. . . . The laws of nature when disturbed by the hand of man are apt to retaliate to his injury; disease and sickness seem to follow those or their descendants, who annihilate the stately forests."

Those prophetic words, were written more than a hundred and fifteen years ago by a civil engineer in the service of the British Government about the forests of Canada as they were in his time.

The first white man to view the forests of the Humber was Etienne Brule, in 1615, who entered the watershed from the Holland River Valley, following approximately the line of the present Yonge Street until he reached the East Branch of the Humber whence he followed the river down to its mouth; but as far as we know, he left no description of the forests. Louis Hennepin anchored off the mouth of the Humber in 1670 and later said of the forests of the Lakes region, "The Forests

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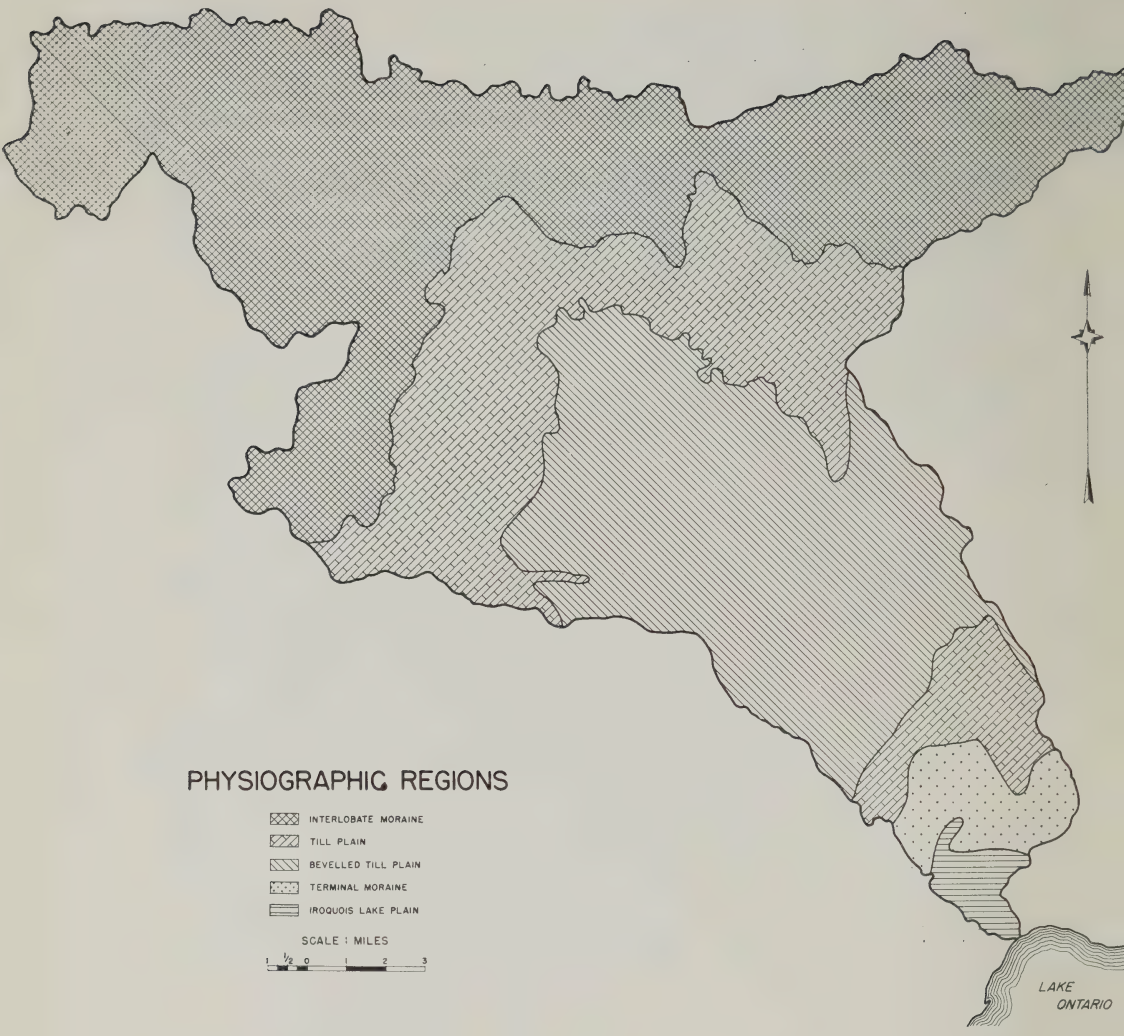
[1]Three Years in Canada—John McTaggart, 1829.



afford all manner of timber fit for building," but he could have had little concept of the stupendous harvest of white pine, maple, elm, beech, oak, ash and many other trees which had awaited the use of mankind, through the ages. Even after this, the era of the fur-traders passed and it was another hundred years, at least, before settlement began and man laid his destructive hand on the forest, upsetting the balance of nature more completely than any other living organism has ever done.

Records show that there were probably five sawmills on the Humber watershed in 1825 including the "Old Mill" which was first built in 1793; by 1850 the number had increased to at least 45 but by 1878 timber was

Clear cutting and pasturing with resultant wind erosion have created virtual deserts on light soil near the headwaters of the Humber. Five feet of soil has blown away here which forest cover would have retained.

becoming less abundant and the number of mills had dropped to 32. One old map dated 1817 shows a sawmill at the outlet of "Eaton Hall Lake" near Eversley which was apparently run by a stream shown flowing from the lake into the East Branch of the Humber. To-day no stream is even shown on the topographical maps published by the General Staff Geological Survey.

In passing it will not be irrelevant to note that a parallel sequence occurred on the Don River where there were 12 sawmills in 1825, 32 in 1851, and 20 in 1878.

In York County in 1880 the cut of square pine timber alone was more than 1,000,000 cubic feet, by 1890 it had dropped to half a million, in 1910 it was 11,000 cubic feet and in 1930 the total cut from farms in York County, including all species such as maple, elm, hemlock and others, was a mere 33,000 cubic feet.

Is it any wonder then that this furious cutting followed in many instances by fire and in most cases by decades of heavy grazing has left but a vestige of the former forest wealth of this region?

A white elm swamp. Many of the woodlots of the Humber watershed are of this type and the similar silver maple-white elm type because soils which grow better types have been cleared for farming. Such swamps frequently are the sources of tributary streams and their forest cover should be maintained.

In 1851, W. H. Smith describes the forests in the vicinity of Toronto as he travels north and westward:

"Immediately after leaving Queen Street, Dundas Street passes through what formerly was a cedar swamp" (evidently Garrison Creek) "but is now dry and has been taken into cultivation." Later on, about 5½ miles from Toronto City Hall, he says: "In this neighbourhood, extending for some distance on either side of Dundas Street, is a considerable breadth of oak plains, known as the Scarlett Plains. These plains are thinly studded over with oak trees, but few of which grow to any large size. . . . The soil (of Etobicoke Township) varies in quality, but a large portion of the timber pine with hardwood intermixed. . . . On the Pine Grove road much of the timber is pine, . . . on the Albion road more of the timber is hardwood and the soil is heavier." Because Smith followed the river valley he saw much of the sandy, gravelly, soils and gives an exaggerated idea of the proportion of pine and oak. To-day, of course, only a remnant of the forest remains in the form of farm

woodlots, but the original forest was undoubtedly made up chiefly of maple, beech, elm and basswood.

The Humber Watershed lies almost entirely in the Great Lakes-St. Lawrence Forest Region as it has been described in Canada[1]. However, Toronto is at the extreme northern tip of the Central Hardwood Forest, so that the forests near the mouth of the river are very different from those to the north and east. In the Central Hardwood area both the mean annual temperature and the average temperature of the four growing months are slightly higher than the average for Southern Ontario, the rainfall is somewhat greater and the snowfall less than the average for the province. This more temperate climate has enabled some of the lowland flora from portions of the southern states to extend their boundaries into Canada, though only a few tree species, notably sassafrass and black walnut, actually reach Toronto.

[1]A Forest Classification for Canada—W. E. Halliday, 1937.

The City of Toronto for the most part stands on light sandy soils deposited in the Iroquois stage of Lake Ontario and the vegetation is characteristic of such soils. The trees are mostly oaks and pines. A typical black oak-red oak-white oak forest is illustrated here.

The late Dr. C. D. Howe[1] described the forest situation in the vicinity of Toronto as follows: "The City of Toronto for the most part stands on light, sandy soils deposited in the Iroquois stage of Lake Ontario and the vegetation is characteristic of such soils. The trees are mostly oaks and pines. There are, however, patches of heavier soils and where their forest remains it is composed of beech and hemlock, notably in Ashbridge's woods in the eastern part of the city. North of the old Iroquois beach the soil gradually becomes heavier, with an increasing clay content, and the oak-pine forest is replaced by maple-beech forest.

"On the western edge of the city in High Park and on the Humber Plains, the vegetation is distinctly Carolinian in its relationships, while on the eastern side it is Alleghanian, the city being the dividing line between the two types of flora. The transition between the two types is very abrupt in High Park where one may pass in a few minutes from the Carolinian of the sand plains to the Alleghanian in the bottom of the deep ravines."

These earlier descriptions, combined with the remnants of the woods remaining to-day, enable us to form a fairly accurate picture of the former forests. These, in turn, furnish clues for the restoration of the forest to certain areas which are suited only to the growth of trees.

Geologically there are four main features of the watershed:

1. The Niagara Escarpment which cuts across the extreme north-west corner of the watershed from Caledon East to Mona Mills.
2. The interlobate moraine which extends across the whole north end of the watershed from Caledon East to the Summit Golf Course on Yonge Street.
3. The glacial till areas of Chinguacousy and Vaughan townships covering the remainder of the watershed south to the old shore line of Lake Iroquois.
4. The lacustrine deposits south of this shore-line which cuts across the watershed from near Weston to St. Clair Avenue in Toronto.

These have all influenced the types of forest which occur. For example, on the escarpment the swamps are mostly covered by white cedar, whereas on the till plains of Peel County the trees in the swamps are mostly white elm and silver maple, and as one goes south swamp white oak and shagbark hickory become intermingled with the other species. On the hills of King Township maple woods predominate with pine and hemlock on the best drained slopes. On the deposits of Lake Iroquois occurred the Central Hardwood species with a poor quality of oak, rather than pine, on the sand plains.

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[1]The Natural History of the Toronto Region—Royal Canadian Institute, 1913

White Pine occurred and in some places still remains on lenses of Fox Sand along the borders of the Humber Valley.

The total area of the Humber River Watershed is approximately 211,405 acres. Of this 22,311 acres or 10.6 per cent has a forest cover of some sort or another and of varying condition from well-managed woodlots to overcut and overgrazed lands which are almost unrecognizable as woodlands.

The existing woodland is made up of:

63.5% Hardwoods
20.0% Mixed woods
and 16.5% Softwood

Owing to the greater difficulties which exist in the reproduction of softwoods and their greater susceptibility to damage by fire, the proportion of softwoods is undoubtedly considerably less than it was in the primeval forest.

The present forest cover may be roughly broken down into types as follows:

Sugar Maple types	36%
Swamp types: Hardwood 23%, Cedar 21%	44%
Poplar types	8%
White Pine types	4%
Hemlock	2%
Others	6%

Clear cutting of woodlots followed by pasturing is the most effective way of destroying woodlands. No farmer would sell any other crop for a fraction of its actual value and permit an outside operator to reap his harvest, yet this is what most land owners do with their forest crop in Southern Ontario.

The other types include the oak types of the Central Hardwood Forest near the mouth of the river and small areas of beech and birch types.

From the above table it will be seen that the present forest consists of 44% swamp types on land which it is economically unprofitable to bring under cultivation, 36% maple types which have been left in woods either because the land was unsuited to cultivation or because they happened to be at the back ends of the farms, and the pine and hemlock types which comprise 6% of the land area and are growing mostly on well-drained steep or sandy land.

Of the existing woods 9,393 acres are considered to be essential to the maintenance and improvement of stream flow. That is, it is either woodland in swamps, or woodland surrounding swamps and springs which feed the headwater streams. In addition to this there are 12,205 acres of land which are considered to be only suitable for the growing of trees and are also essential for the proper protection of stream sources which makes in all a total of 21,598 acres which should be in permanent forest cover.

This type of forest covered most of the Humber watershed. These lordly pine trees towering as high as one hundred and fifty feet were thirty years old when Indians carrying furs to the first French Trading Post at Toronto about 1720 passed beneath them.

Some of this land is in large blocks which could well be taken over for county and municipal forests and put to multiple use, including recreation. This would mean that it would automatically be placed under forest management and retained as permanent cover.

On the other hand a considerable portion of it is in private lands and will always remain so. This land should also be maintained in permanent woods and the steps which are necessary to ensure this are:

1. The exclusion of cattle.
2. The prevention of fire.
3. The education of the owner in the value of his woods and particularly of his young growth and reproduction.
4. Reforestation of land where natural regeneration cannot be induced in a reasonable time.

Since the maintenance of these woods, as differentiated from those which are not adjacent to source areas, is of vital interest to the river valley community as a whole, it would be the duty of the river valley authority to see that such woods were established, maintained and cut according to good forestry practice which would mean the owner could not cut just when and how he wished. In return for the sacrifice which he would be making the authority should be prepared to help him out in the following ways:

1. By supplying fence for the woodlands.
2. By bearing part of the cost of reforesting denuded land.
3. By marking the woods for thinning.
4. By giving him an approximate idea of the value of what he has to sell and helping him in the marketing of it.

This would require the services of forest engineers who could be either loaned to the authority by the Department of Lands and Forests or, on the larger watersheds, employed full time by the authority.

Only by such means can the forest be restored, not to its original grandeur, which would be neither economically feasible nor desirable, but to a point where the balance of nature is restored in accordance with our present mode of life. A balance, where the resources of water, land, forests, wild-life and recreation are used to the full and yet are never depleted but serve all the people of the river valley for all time.

DISCUSSION

CHAIRMAN LEGGET: I am sure, Ladies and Gentlemen, you would wish me to express to Mr. Barnes your appreciation for a very good introduction to our studies of conservation in this district. I think you would also wish me to say with what interest we saw those magnificent slides, showing what the forests of the country once were. It is easy to imagine and not foolish to imagine, what would be the thought of Etienne Brule, if he came down the Humber to-day, not more than three hundred years after his first visit, and saw what had happened to the forests that were there then.

Before I proceed to ask for questions, which I am sure Mr. Barnes will be glad to answer, Mr. Baker has just handed to me a copy of a resolution that was moved and passed unanimously by the County of York Council on the 15th of November, to this effect:

> THAT this County Council recommends to the municipalities situated in the Humber River Watershed the advisability of establishing a Humber River Conservation Authority.

I am sure you will share with me the pleasure which that announcement gives as indicating a real start at active measures for conservation in this district, and may I pause to see if you have any queries you would like to direct to Mr. Barnes, or any comments you would like to make on his paper.

MR. H. GRIGGS (Mimico, Ont.): While it is fresh on our minds, I might say in the County of York we have quite an intensive reforestation programme. To what extent have the other counties covered by this region gone into reforestation too?

MR. J. F. L. SIMMONS (District Forester): York County has no forests within the Humber Watershed and Peel County has merely taken the preliminary steps in establishing one; it acquired about fifty acres of land in Lot 13, Concession III of Albion Township in 1940 and 69,795 trees have been planted there covering thirty-eight acres but there are approximately three hundred acres of sub-marginal land in this area alone which should be reforested, more especially because it is the only area of any size in the basin of the West Branch. In addition, there are at least 17,000 acres of sub-marginal land in Albion and Caledon Townships and within the Humber watershed which should form part of the Peel County Forest.

As for Simcoe County, the Humber barely touches the south end, and in that particular area there is no reforestation. The Humber itself doesn't drain more than four or five thousand acres each of Simcoe and of Dufferin Counties, but there are about two thousand acres in Dufferin County drained by the Humber which should be reforested. Their present reforestation programme doesn't affect the Humber at all.

York County is really the one most interested to date as far as reforestation is concerned.

DR. HARVEY AGNEW: Mr. Chairman, the speaker referred to King Township as being a particularly bad fire risk. I wonder if he would care to elaborate on that comment?

MR. A. S. L. BARNES: The only reason I mentioned King and Albion Townships is because that is where most of the pine which is left is still growing. The land is also hilly which means that fires travel faster and that is where the chief fire risk is.

MR. F. KNAPP (Toronto): I would like to know the difference between a Carolinian forest and an Alleghanian, and what significance that has in conservation.

MR. A. S. L. BARNES: The Alleghanian forest corresponds very closely to the forests of southern Ontario, that is forest of the maple-beech type and white pine-hemlock types. The Carolinian forest is composed mostly of oak types, such as we find toward the mouth of the Humber, and the significance in connection with conservation as related to reforestation is that if we know which types and species of trees grew naturally there we are in a much better position to carry out reforestation schemes on the sites which at present have no trees.

THE DON RIVER SYSTEM

Dr. D. F. Putnam and L. G. Reeds

Department of Geography

University of Toronto

THE Don is not one of the larger rivers of Ontario; rather it derives its importance from the fact that its drainage basin has the highest average density of human population of any drainage area in the Dominion of Canada. Also, since the City of Toronto lies at the edge of a plain of very low relief, any feature breaking the monotony is welcomed; hence the Don with its rather shapely incised valley attracts a great deal of attention as an actual and potential recreational area.

Most of the streams in south central Ontario rise in the higher land of the Niagara Escarpment or the Oak Ridges Moraine and empty into Lake Ontario after traversing the intervening plains of glacial drift. Both the Humber and the Rouge, lying on either side of the Don system, conform to this pattern. The Don itself is different. The territory on the moraine which might be expected to provide its catchment area has been captured by lateral tributaries of the Rouge and Humber so that the Don is, in effect, a beheaded river system. At the other extreme, its lower reaches, almost completely canalized, empty into Toronto Harbour and not directly into Lake Ontario. The intervening area, being one of the most completely settled in the province, is also almost completely denuded of its original forest cover and a great area is now devoted to urban uses.

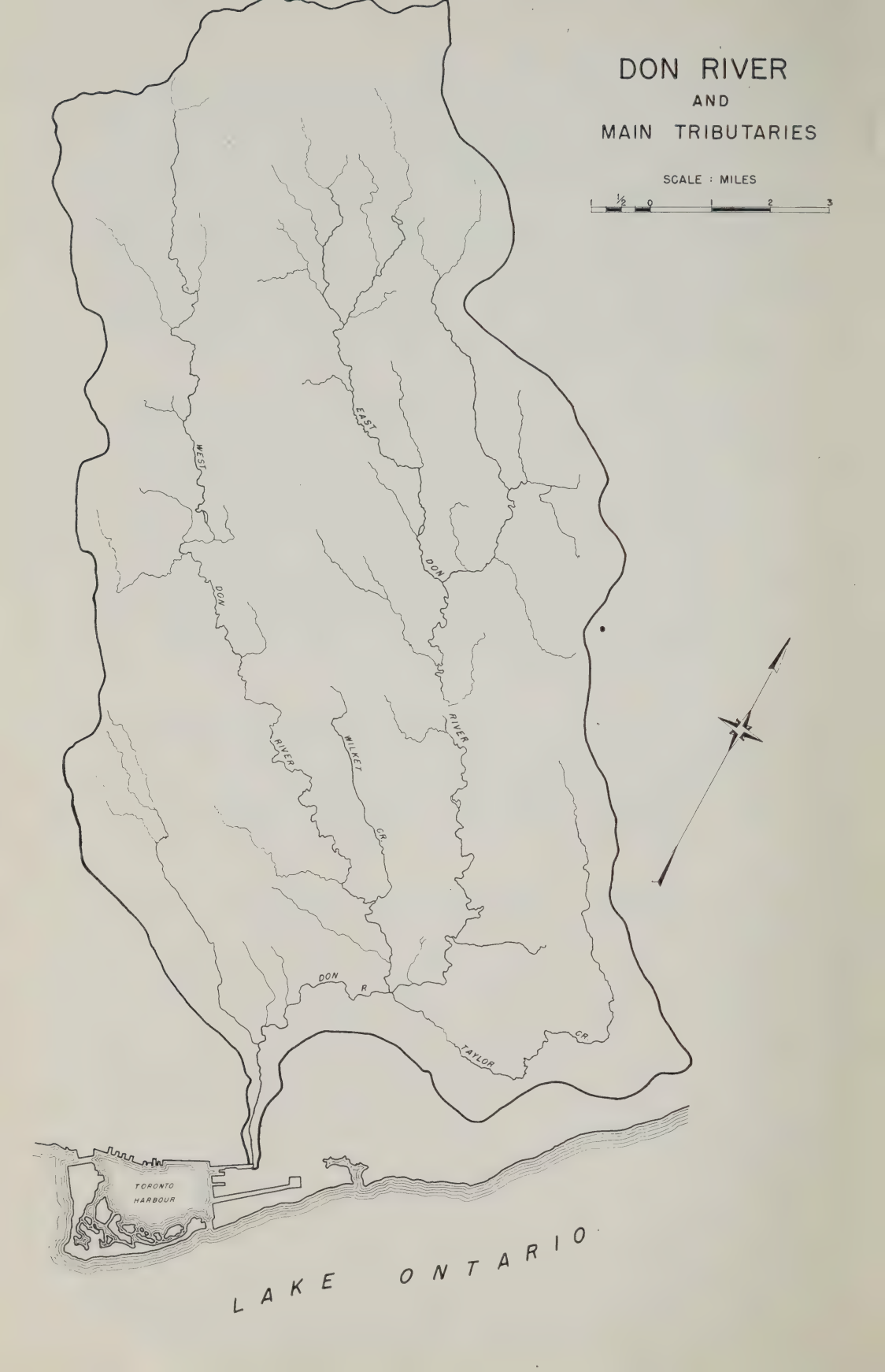
In the southwestern part of the region, rather large areas of Milliken loam are also located. Here, upon a mildly drumlinized ground moraine, the slopes are not usually considered excessive but, with every acre under agricultural production, slope washing is in evidence. To the southwest are found somewhat heavier soils, designated as Ontario loam and Chinguacousy clay loam, the latter tending to be somewhat poorly drained.

The Townships of Vaughan, Markham and North York contain a

ERRATA

The last two paragraphs on page 25 should follow the paragraph on page 37 commencing:

"In the same vicinity .... Elsewhere on the slopes, contour farming is indicated."


DON RIVER
AND
MAIN TRIBUTARIES
SCALE : MILES
½
0
1
2
3
WEST DON RIVER
EAST DON RIVER
MILKET CR.
DON R.
TAYLOR CR.
TORONTO HARBOUR
LAKE ONTARIO


DON RIVER SYSTEM
MUNICIPALITIES
SCALE : MILES
1 1/2 0 1 2 3
HOPE
TESTON
MAPLE
RICHMOND HILL
VAUGHAN
YORK
CONCORD
MARKHAM
THORNHILL
NEWTONBROOK
NORTHMOUNT
WILLOWDALE
LANSING
NORTH YORK
ORIOLE
YORK MILLS
SCARBOROUGH
TORONTO
FOREST HILL
VILLAGE
LEASIDE
EAST YORK
TORONTO HARBOUR
LAKE ONTARIO

Such natural beauty on this section of the Don close to a large metropolitan area

A few statistics will help to clarify the situation. The area of the Don Watershed is approximately 85,120 acres or 133 square miles. The length of the stream channels shown on the National Topographic maps including both the east and west branches, is about 126 miles. The area of woodland remaining is 6,400 acres or 10 square miles according to a rather generous estimate; this is 7% of the total area. The area of urban

should be preserved for all time.

land, that is, the built up area, is about 12,800 acres or 20 square miles and 15% of the total; of this 5,760 acres, 9 square miles, or 6% of the total, lies within the limits of the City of Toronto.

A number of municipalities are involved in the problem of the Don River System as the accompanying map makes clear. The headwaters are for the most part in Vaughan and Markham Townships; the mid portions of both branches are found in North York, while the lower reaches and tributaries are shared by Leaside, East York, Forest Hill and Toronto. One stream of considerable size rises in Scarborough Township and an insignificant southwestern part of the watershed lies in York Township. The Don, therefore, is the concern of all municipalities in York County south of the Interlobate moraine.

The problem to be solved by the Don Valley Authority, may be summarized briefly. How can the landscape be so organized that the best possible use may be made of its various features, bearing in mind that people have to live and work in the area, and that many others, who live and work elsewhere, wish to use it for recreational purposes? How can a stream, in a climatic environment conducive to rapid spring run-off and mid-summer drought, be made to maintain a continuous flow in sufficient volume for recreational purposes? We cannot answer these questions; indeed no one can, for if the answer were forthcoming, there would be no need to set up an authority to study the matter. We can, however, present some of the geographical background of the area.

CLIMATE

The following table (1) is compiled from the climatic summaries published by the Meteorological Division of the Canadian Department of Transport. The figures represent the average of 105 years observations at Toronto.

	Mean Temperature	Mean Precipitation (inches)	Mean Snowfall (inches)
January	23	2.71	16.0
February	22	2.43	15.3
March	30	2.58	10.7
April	42	2.48	2.8
May	53	2.91	0.1
June	63	2.67	....
July	69	2.98	....
August	67	2.73	....
September	60	2.90	....
October	48	2.43	0.4
November	37	2.70	4.2
December	27	2.63	12.4
Year	45 (avg.)	32.18	61.9

Table 1

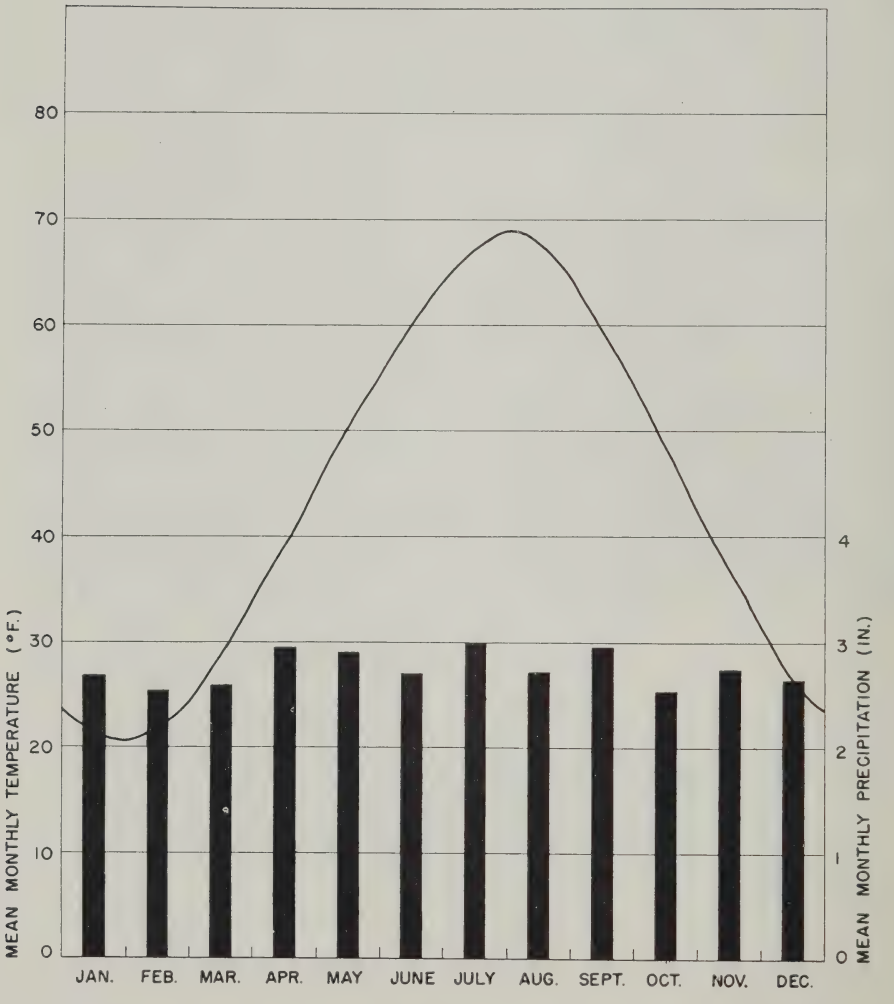


Figure 1

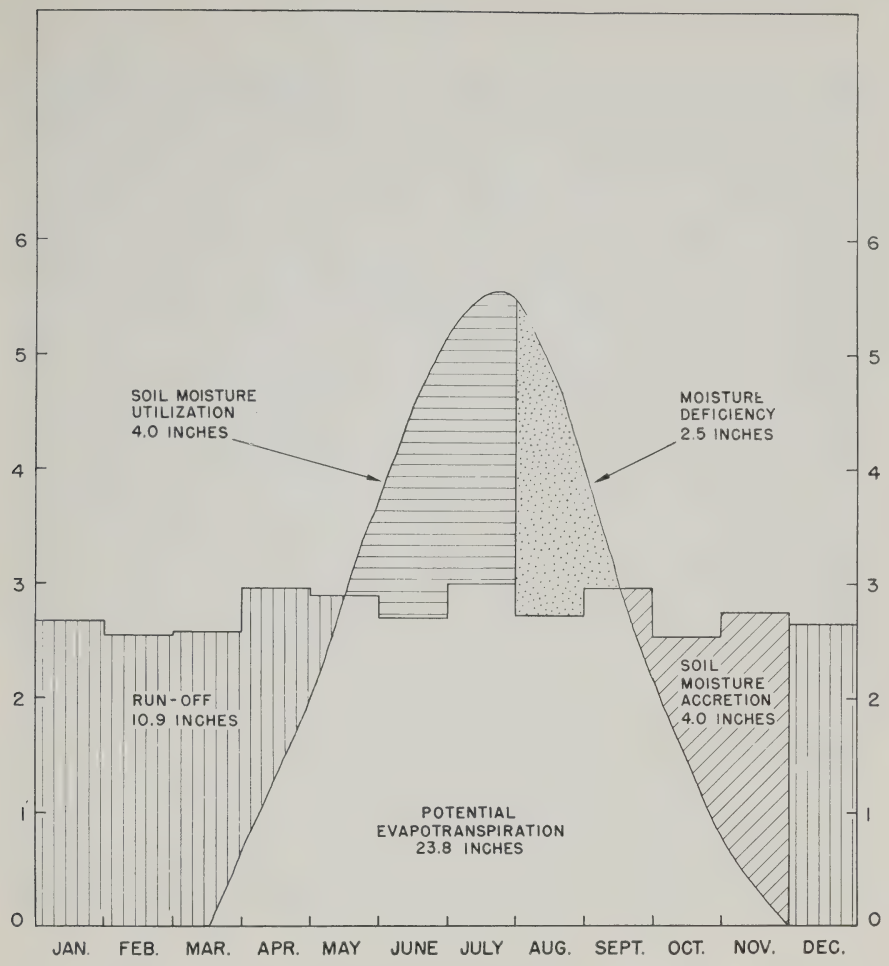


Figure 2

These figures are illustrated in the accompanying diagram (fig. 1).

We need, however, to know something more about climate than just how warm it is or how much snow or rain falls in each month on the average. The relationship of temperature and moisture supply, or the evaporative power of the atmosphere and the use of water by the plant cover are important also. C. W. Thornthwaite, a noted American climatologist, has recently been giving a good deal of study to this matter and has derived a method of estimating *evapotranspiration.* Thornthwaite's theories are currently being tested by Mr. L. J. Chapman and Mrs. M. Sanderson at the Ontario Research Foundation. To the courtesy of the latter we owe the accompanying diagram of the moisture relationships of the Toronto climate (fig. 2). It makes clear a number of peculiarities of the Toronto climate. Our precipitation is very evenly

There has been little thought concerning public purposes in land use. This site, the most popular picnic area on the Don River, is now for sale and will be closed to the public forever unless immediate action is taken.

distributed but not so the demand for water. In winter and spring we have far too much, whereas in late summer, moisture is apt to be deficient. Those figures, *runoff* 10.9 inches and *moisture deficit* 2.5 inches, interest us. Particularly the fact that much of the excess moisture of winter comes as snow and remains to run off in the spring flood. The climate itself we can do nothing about, but it is one of the factors with which we have to deal. Can we, in some way, regulate this supply of water, which *in toto* is ample, so as to maintain a flow for recreational purposes and to help get rid of pollution in the lower river?

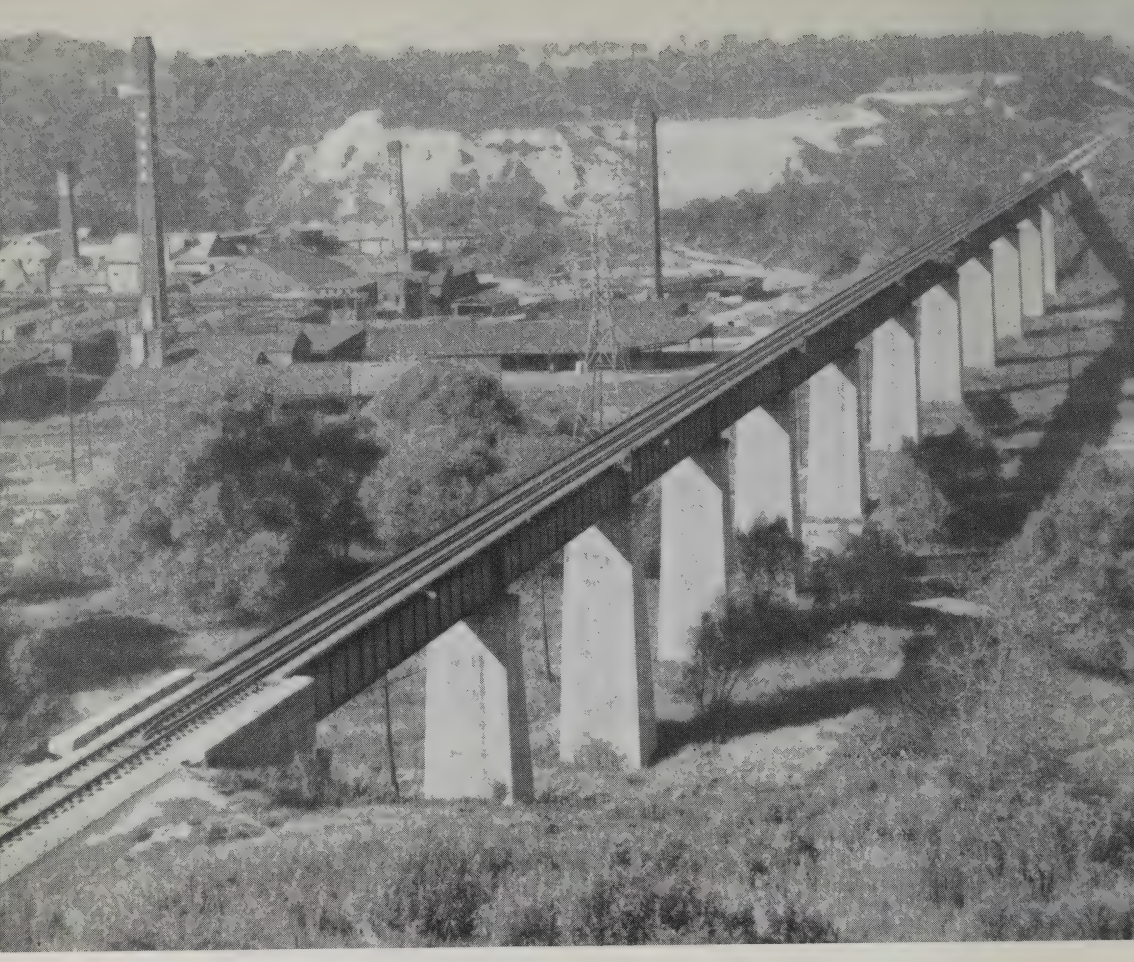
LAND FORMS AND SOILS

Our knowledge of these matters comes largely from the investigations

This, too, is the Don Valley—you are invited to supply your own caption.

of the workers of the Ontario Research Foundation and the Ontario Soil Survey, supplemented by the earlier publications of A. P. Coleman and F. B. Taylor. The land forms of south central Ontario are all due to the effects of the Pleistocene glaciation and the action of water erosion and deposition since the disappearance of the ice. In the Don region, the only place that bedrock may be seen is in the pits of the Don Valley brickyards where the Dundas shales have been exposed. The overlying drift is composed in part of these shales and is therefore of a somewhat clayey nature.

On examination of a map of the area, one notes that the grain of the country is predominantly northwest-southeast. That is the direction of the valleys themselves, and of the ridges between them. In addition there are a few scattered low hills of drift oriented in the same direction. Further, if one views the area from the air, or examines an air photograph, one sees curious markings on the ground with a similar trend This is the work of the last ice sheet which moulded the till beneath it as it radiated from its main thrust through the basin of Lake Ontario. The higher land at the northern end of the watershed, the Oak Ridges or interlobate moraine, is the result of disposition between the lake in the Ontario basin, and that of the Lake Simcoe basin to the north.



The Don Valley, even above Bloor Street, is marred by industrial developments such as this.

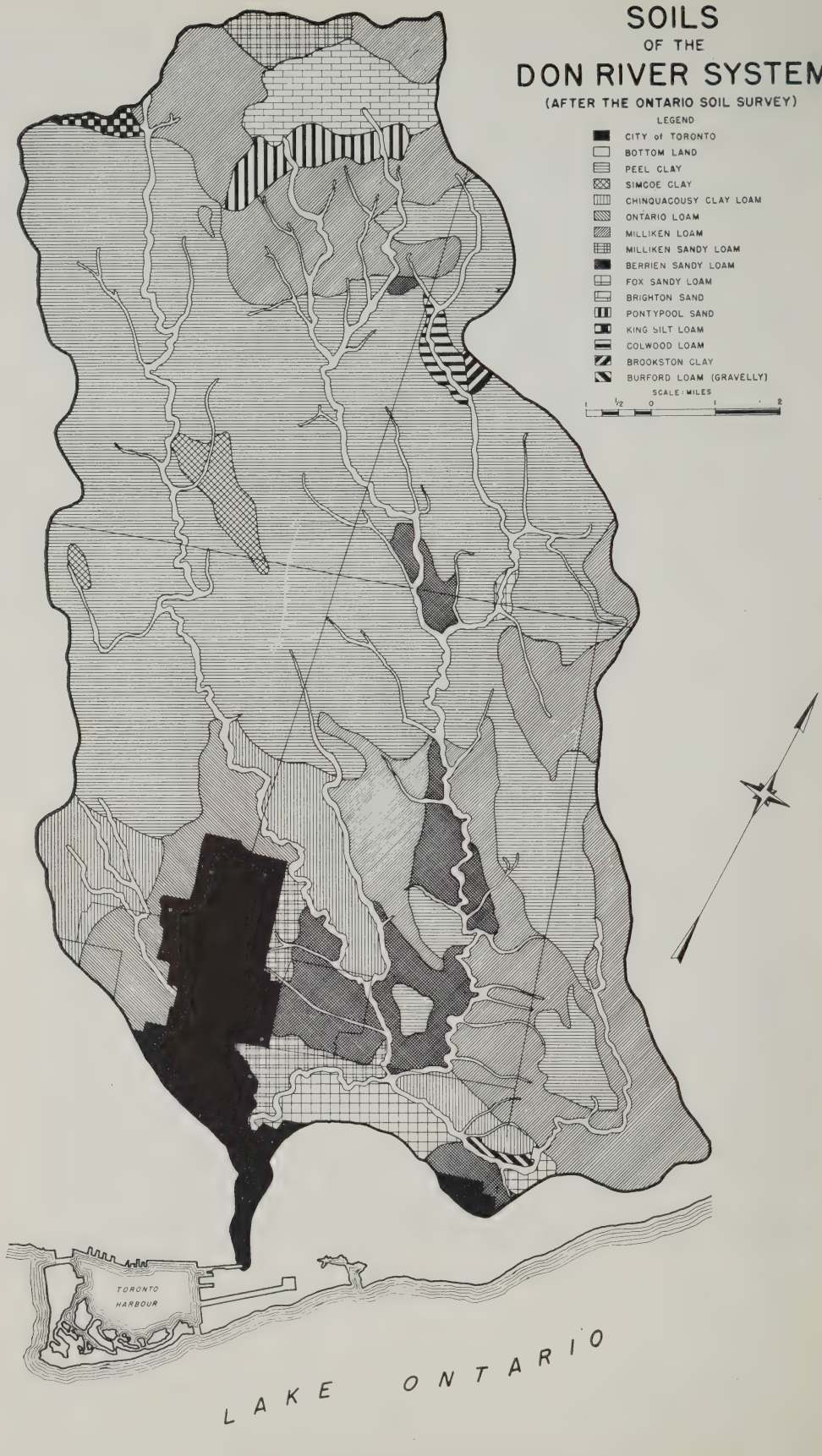
The meeting of the ice sheet produced a great deal of water, and for a time temporary lakes occupied parts of the region. The flattish clay plain in Vaughan and Markham Townships is the work of such a temporary lake which washed off some of the low ridges and partially filled some of the hollows—a bevelled plain, it is sometimes called.

Another, and much longer lived lake, occupied the basin of Lake Ontario after the ice had left it, but before the St. Lawrence valley was open to the sea. This body of water, which stood finally at a level somewhat higher than Lake Ontario, is known as Lake Iroquois. Its shoreline can be seen near Scarborough Bluffs and at Avenue Road hill in Toronto, taking in both cases the form of a marked shore cliff. In the Don area itself, silt, sand and gravel terraces are found indicating the old water level.

The soil types of the Don drainage basin are indicated on the accompanying map. They are, of course, developed upon the geological materials

The flats of the lower Don have been occupied by industrial plants and its channel converted, in effect, into an open sewer.

The mouth of the Don has been completely taken up for commercial purposes.


SOILS
OF THE
DON RIVER SYSTEM
(AFTER THE ONTARIO SOIL SURVEY)
LEGEND
CITY of TORONTO
BOTTOM LAND
PEEL CLAY
SIMCOE CLAY
CHINQUACOUSY CLAY LOAM
ONTARIO LOAM
MILLIKEN LOAM
MILLIKEN SANDY LOAM
BERRIEN SANDY LOAM
FOX SANDY LOAM
BRIGHTON SAND
PONTYPOOL SAND
KING SILT LOAM
COLWOOD LOAM
BROOKSTON CLAY
BURFORD LOAM (GRAVELLY)
SCALE: MILES
1
1/2
0
1
2
TORONTO
HARBOUR
LAKE ONTARIO

mentioned above, the active agents of development being the climatic factors and the hardwood forest vegetation of the region.

At the extreme northern limit of the watershed, in the interlobate area, are small areas of sandy soils designated as Pontypool sand, Brighton sand and Milliken sandy loam. The coarse open texture of these soils and their consequent droughty nature makes them of little value for agriculture and they should be regarded as potential forest land.

In the same vicinity, on the slopes of the moraine, are areas of Milliken loam, developed upon glacial boulder clay or till. In most cases these areas are to be regarded as good agricultural land. There are, however, many small headwaters of the Don which are engaged in active erosion here, particularly in spring flood periods. In such strategic spots it will be necessary to restore the protective covering of forest vegetation. Elsewhere on the slopes, contour farming is indicated.

Lastly, in the lower valley of the Don, in the area which was influenced by the high water levels of Lake Iroquois, there are some sandy soils designated as Fox sandy loam and Berrien sandy loam. The former is a well drained soil with a fully developed profile while the latter is rather imperfectly drained because the sandy layer is underlain by clay at a depth of three or four feet. These soils are of value for specialized agriculture but, for the most part, the area has been appropriated to urban uses.

THE PROBLEM OF LAND USE

The history of land use in the Don area is simple. Being close to Toronto, it was early deforested and pretty completely farmed. Very few woodlots of any size have survived. Agricultural use has changed through the years from an early extensive enterprise involving wheat as a major crop to more intensive uses such as dairying. Latterly, with the development of personal transportation, residential use has crowded out agriculture; to-day 15% of the whole area is in building lots and more land is being thus taken up every day. Apart from the provision of streets and highways, there has been little thought concerning public purposes in land use. Few parks, playgrounds and general recreational areas have been laid out. The Don has been the victim of a neglect equal to that of the Humber. Perhaps greater, because the flats of the lower Don have been occupied by industrial plants and its channel converted, in effect, into an open sewer. Riverdale Park, of course, remains an open public area, but there is need for more public areas along the Don.

The aesthetic values of the scenery along the Don have been appreciated from the very founding of Toronto. In that same year, 1793, Governor Simcoe selected the site and made preparations for the building of Castle Frank which was the forerunner of all the country estates of

Aerial photograph of a part of Scarborough Township showing part of Taylor Creek. The peculiar surface markings are due to the moulding action of moving ice. Note how these rather minor earth features have controlled the drainage.

influential Torontonians. There are to-day many beautiful country places along the Don Valley and they have preserved much of the original aesthetic values. It would be a pity if they should be broken up by the usual type of sub-division.

A public purpose of a sort is served by the golf courses to be found in the vicinity of Thornhill and elsewhere, but of course that is appreciated only by golfers. Golf courses, however, also tend to give way before subdivision in the face of great population pressure.

Before it is too late, the public purposes in land use in the Don Valley require to be carefully studied. A detailed inventory of the land resources must be made and information secured concerning the ownership and purpose in ownership of all potential public land. Having done this, a Don Valley authority will still have plenty to do in the effectuation of its programme over the coming years.

DISCUSSION

MR. MACNALLEY: Has there yet been any step taken toward the creation of a Don River Valley Authority?

CHAIRMAN LEGGET: So far as I know, not yet, but one of the things I was going to say before we went on to the next paper was that the hope is that a Don River Sub-Committee, corresponding to the Humber River Sub-Committee, may be formed at this conference which will be the first step in the direction you indicate. Will any of you who are interested in the formation of a Don River Valley Authority be good enough to speak to Mr. Baker.

MR. KETCHISON: Professor Legget, I might inform you that last Monday night the Don Valley Conservation Association was formed with Mr. Roy Cadwell, of Osgoode Hall, as Secretary.

MRS. ROBERTSON: I was going to ask Professor Putnam just how fantastic it is to dream of the dirty Don, now running through Toronto, as a recreational paradise for children—is it too much to expect?

DR. D. F. PUTNAM: Physically, I don't think it is fantastic at all, but it is the mental attitude of the people that you have got to change. The physical work can be done. I don't know just how far we can get with the educational work that must precede it.

MRS. ROBERTSON: I might point out that the Parks Committee asked that something over a million dollars be devoted to outdoor swimming tanks for Toronto but it seems so much more sensible to rehabilitate our natural resources, because the old swimming hole is still much more to be desired than swimming tanks.

CHAIRMAN LEGGET: I think we all share Mrs. Robertson's concern about the river, and many of us can imagine very readily what one million dollars could do for the conservation of the Don itself.

MR. E. KAY (Toronto): In regard to the development of the Don Valley, I might say I have been somewhat interested in the subject for the last twenty odd years, and I have done a certain amount of research work on the Don Valley. I find the biggest obstacle neither physical nor fantastic. The biggest obstacle to the development of the Don Valley has been political and that has been the stumbling block down the line for years. Until we iron out the political differences in the Don Valley, I don't think we will get anywhere.

CHAIRMAN LEGGET: I am so glad you have raised that, since possibly by raising political difficulties to the surface we may go a step toward their solution.

SOIL CONSERVATION FARMING

By G. N. Ruhnke

Professor and Head, Department of Soils,
Ontario Agricultural College

AT the two previous conferences sponsored by the Department of Planning and Development, papers were presented which dealt with the importance of erosion control and soil conservation for agricultural lands in relation to the other phases of the river valley development program.

Since those conferences, further study has been given to the fundamental soil problems involved and some experience has been gained in planning soil conservation programmes for both individual farms and for whole counties. This paper presents some further aspects of the general problem of soil conservation planning which will have to be taken into consideration if worth-while progress is to be made in soil conservation work on our agricultural lands in this Province.

The first point, which in some of our earlier discussions has been somewhat overlooked, is that agricultural or farm lands are privately-owned lands and are not, therefore, like the public domain, subject to arbitrary utilization for this or that programme, no matter how desirable it might seem to be. Any kind of a new land use and soil conservation programme which might be planned for farm lands will only become effective if and when found acceptable by the owner of the land, and if he, himself, will carry out the recommended practices. Thus, the individual farmer, ultimately, is the key man in the overall organization for the promotion of land use and soil conservation on the agricultural lands. It is the farmer who must be reached finally and who must be convinced that soil conservation farming will pay as well as, or better than, his present system of cropping and soil management practices before he will undertake to make the necessary changes to implement the new programme.

Ultimately, the more effective approach to the farmer will be through the individual farm planning service. This is the means adopted by the United States Soil Conservation Service in the various conservation districts after having been set up under the local authorities. By complete, detailed surveys of soil, slope, degree of erosion, land types, and the present land use, the farm planning technicians determine the land use capabilities and, in consultation with the farmer, replan the land use in accord with the land use capabilities and set up a complete programme for the management of the farm with respect to soils, crops, livestock, woodlots and pasture lands, as may be necessary.

After the plan has been agreed upon and found adapted to the farmer's particular needs, he may or may not agree to proceed with the revised land use programme and recommended practices for soil con-

Even more destructive than gully erosion is the insidious effect of rill and sheet erosion which almost imperceptively removes the topsoil from the land.

servation. If he does agree to undertake the plan, the soil conservation service provides the necessary technical direction and supervision in initiating the recommended conservation practices.

It is obvious that in order to deal with larger areas of farm lands and to give such individual planning service to the land owners requires a very large staff of highly trained specialists in soil conservation work. When it is realized that such planning and revision of land use immediately involves the economic position of the farmer, the farm planners undertake a heavy responsibility in this work, which is bound to have an important bearing on his farm operating expenses, and labour income.

Recognizing the value of soil conservation demonstration projects as a means to encouraging the interest of farmers in planned land use and soil management, the Department of Soils of the Ontario Agricultural

College, during the past year, has initiated a limited farm planning service in co-operation with the Agricultural Representatives in the following counties: Wellington, Simcoe, Brant, Peel, Lincoln, Norfolk and Peterborough. The principle which has been followed has been to select as co-operators farmers who were sufficiently interested in soil conservation to agree to undertake a full programme which would be planned to meet the needs of each particular farm. One experienced soil conservation specialist and two assistants were detailed to this work and nineteen farms, ranging in size from 85 acres to 840 acres have been surveyed under the farm planning scheme. Sixteen of the co-operators are considered as fully active participants in the programme; three others have their plans but, at present, are showing little indication of undertaking to put these into effect.

The following list of conservation practices has been recommended, as needed, for these farms:

Fertility Maintenance
Pasture Improvement
Gully Control
Diversion-Interception Terraces
Field Strip Cropping
Fence Removal
Farm Water Supply
(ponds, spring, stream)
Reforestation
Improved Crop Rotations
Pasture Renovation
Grassed Waterways
Contour Cultivation
Contour Strip Cropping
Land Clearing
Drainage (open and tile)
Woodlot Management

As a typical example of these soil conservation demonstration projects, brief mention may be made of the Harry Blewett Farm, on No. 7 Highway, just west of Peterborough. This project is of special interest because it has involved the utilization of the greatest number of soil conservation practices of any of the farms so far planned.

In order to provide for most efficient land use, it was necessary to remove fences. Among these were old stone fences three to four feet in depth and eight to ten feet in width which had to be disposed of and afforded splendid opportunity to demonstrate the utility of the bulldozer for this purpose. Wide, deep holes were excavated and the stone fences were buried underground, where they would no longer be an interference to cultivation.

The character of the topography and the predisposition to sheet erosion over much of the farm necessitated the adoption of contour strip cropping for rotation cropland. The initiation of the strip cropping during the past season commenced with the planting of the corn crop in strips, alternated with hay.

The portion of the farm to be left to permanent pasture necessitated a special pasture improvement programme. The farm woodlot, which capped the highest hill on the farm, has been pastured by livestock and

Overgrazing soon reduces land to the point where it is non-productive as indicated by the growth of such weeds as mullein and milkweed. Poor, sloping, stoney land is more economically used for woodland.

had suffered to a considerable extent from sheet erosion on the slopes. This area was fenced off from livestock and the adjacent portion of land, used for pasture but too steep to be safely maintained for this purpose, was immediately reforested.

In planning the new cropping pattern for the farm, it was necessary to take into account the feed requirements for the livestock (dairy cattle and hogs) so that maximum production could be obtained. Changes were made in the crop rotation to suit the new programme so that the required volume of grain, hay and corn would be produced each year.

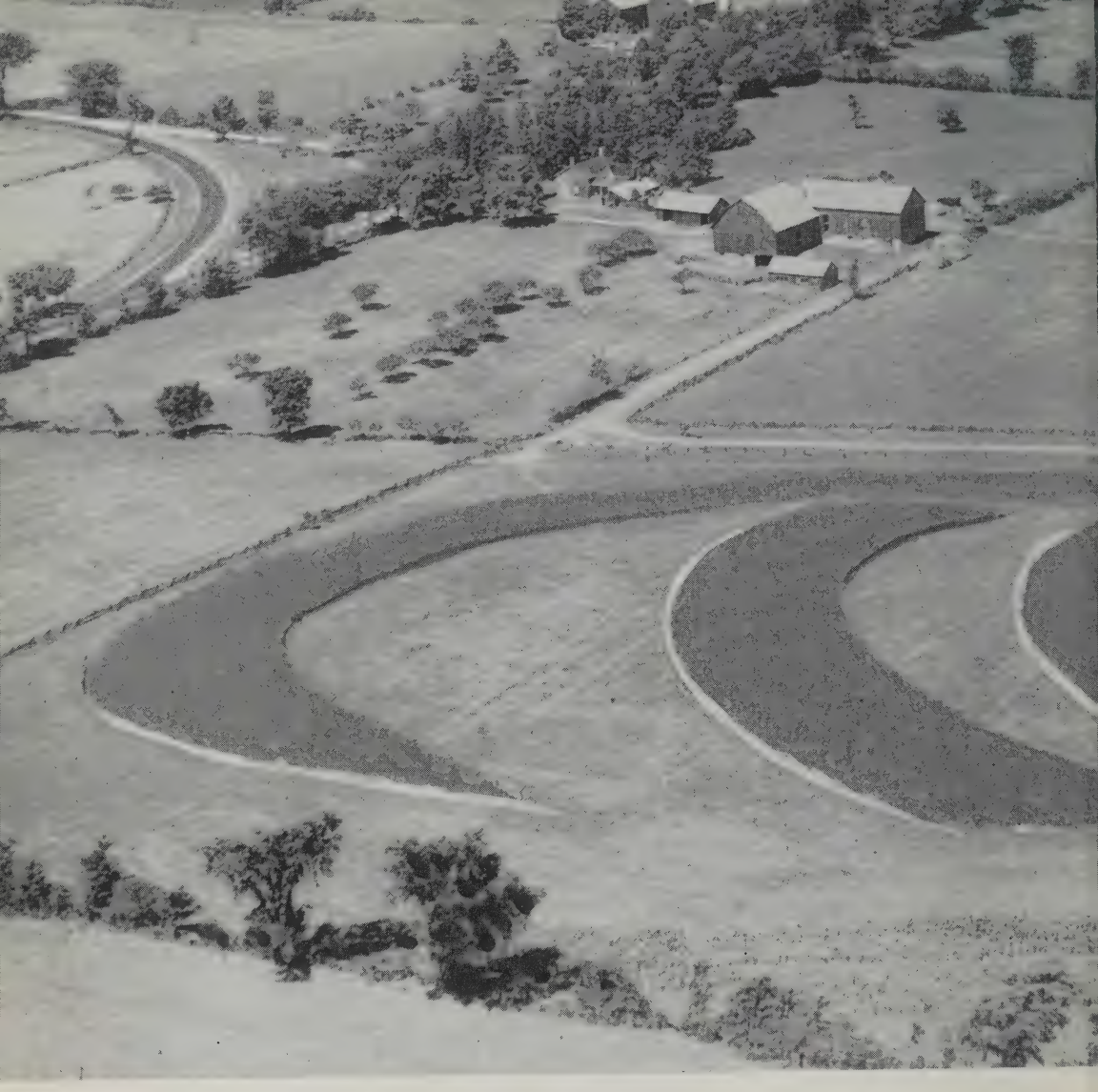
A complete inventory of the fertility of individual fields was made by the soil advisory service of the Department and a programme for the use of manures and fertilizers was set up to fit the new cropping scheme.

From the foregoing it is apparent that the business of replanning the farm for improved land use and soil conservation is rather complicated and involves much more than is revealed in many popular pamphlets and circulars being published on this subject. However, it is an objective worth working for and it is hoped that as these demonstration projects become established and neighbouring farmers see the benefits to be derived from soil conservation farming, wider adoption of the improved practices will come about rapidly.

It must not be inferred that the only farms on which soil conservation practices are being followed are those which have been surveyed by the farm planning service. *Many of the practices which are basic in the planned soil conservation programme have been followed for years by our more progressive farmers in the various parts of the Province.* There are plenty of instances in our good agricultural areas where farms that have been under cultivation for over a century are producing far above the average yields of farm crops, and under the present systems of management are likely to continue to do so indefinitely. *In most of these cases the farmer has appreciated that the maintenance of soil fertility is a keystone to successful land use and soil conservation.* These farmers have not mined their soils, but have realized the necessity for putting something back into the soil as a capital investment in maintaining the productivity of their lands. Much of the soil deterioration which has taken place on our rolling lands has been initiated by failure to maintain fertility. Continued cropping has reduced the organic matter (humus) to a critically low level. The soils have lost their natural granular structure and have become dispersed and naturally more subject to wind and water erosion. The depletion of the soil organic matter is now known to be largely a function of faulty crop rotations and the failure to maintain the nitrogen supply of the soil. Quite aside from the need for special practices, contour strip cropping, contour cultivation, diversion terraces, etc., for erosion control, there is need, everywhere, for recognition of the fundamental importance of "building-up" and maintaining the fertility of the soil. This will always be the basis of soil conservation farming.

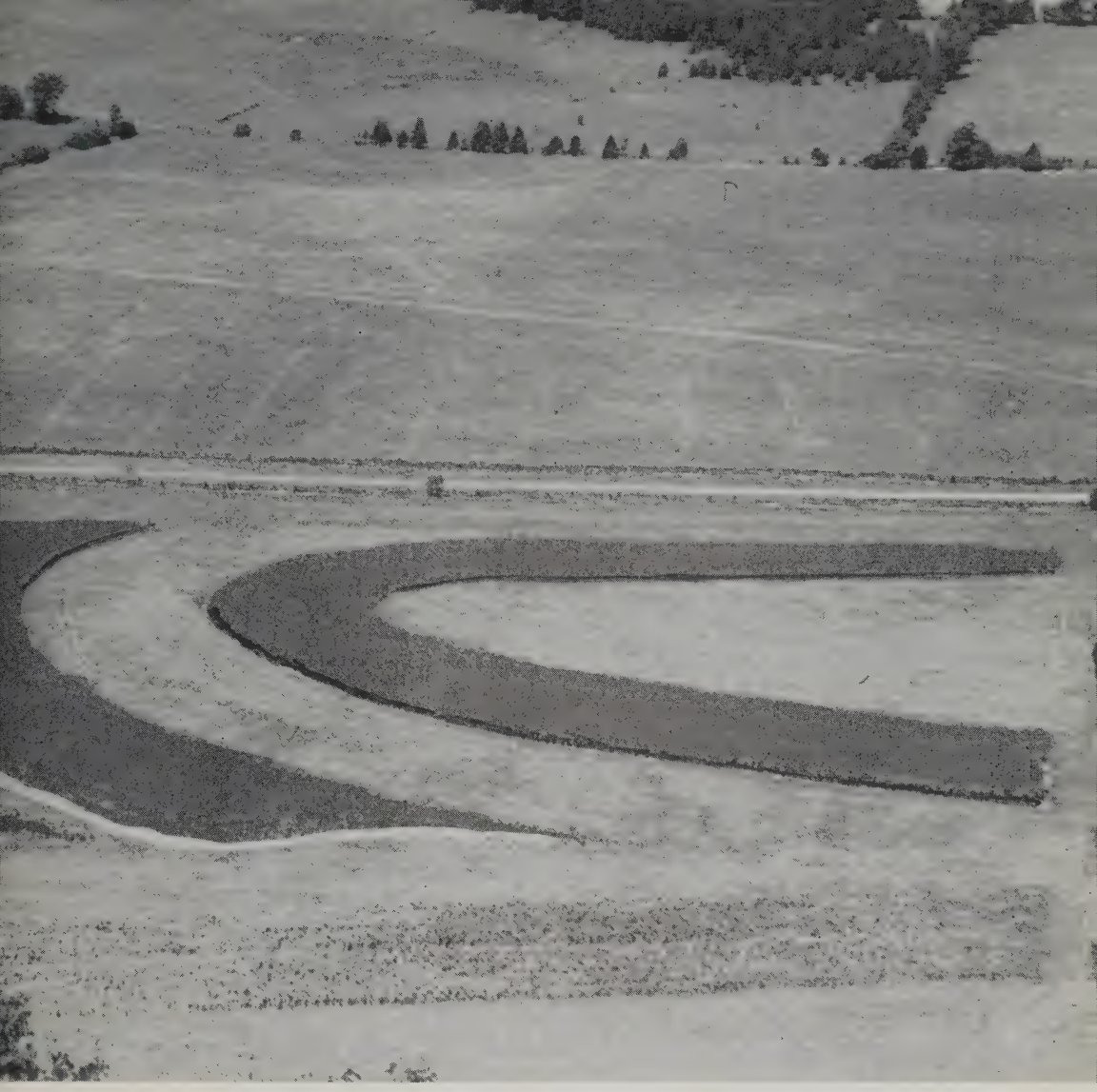
Since it is apparent that the advanced practices of contour cultivation, contour strip cropping, terracing, etc., are not adapted to or needed in all cases of revised land use, and will be adopted even where needed only after an extensive educational and demonstration programme, we may well ask the question, "What are we doing meanwhile to advance the work of soil conservation *otherwise* on our farm lands?"

With the benefit of years of experience in soil surveys, fertility experimental plot work and the soil advisory service, we have concluded that the best approach at present to interesting the *average* farmer in soil conservation is through the medium of his soil fertility problems. He may not comprehend the extent and the seriousness of sheet erosion; he may not be impressed by the possible loss of water by runoff; but he



A typical example of the Ontario Agricultural College's soil conservation demonstration

becomes very actively interested when lowered crop yields, failure of clovers or mineral deficiency diseases of livestock are the problems under discussion. One of the main reasons for this is that he can see these factors in operation, and also, they have an immediate effect on the income from his farm business. One other reason for his interest in these problems is that the effects of the treatments may be seen in a single season and a profitable return derived at once.



ojects is the farm of Mr. Harry Blewett on No. 7 Highway, just west of Peterborough.

It is for these reasons in part that we are currently promoting the plan of county soil conservation programmes after the pattern of the one drafted and approved for Waterloo County a few weeks ago. The principles on which this programme is based are so fundamental that it may be useful to briefly outline them at this point.

The headquarters for the direction of the programme is the office of

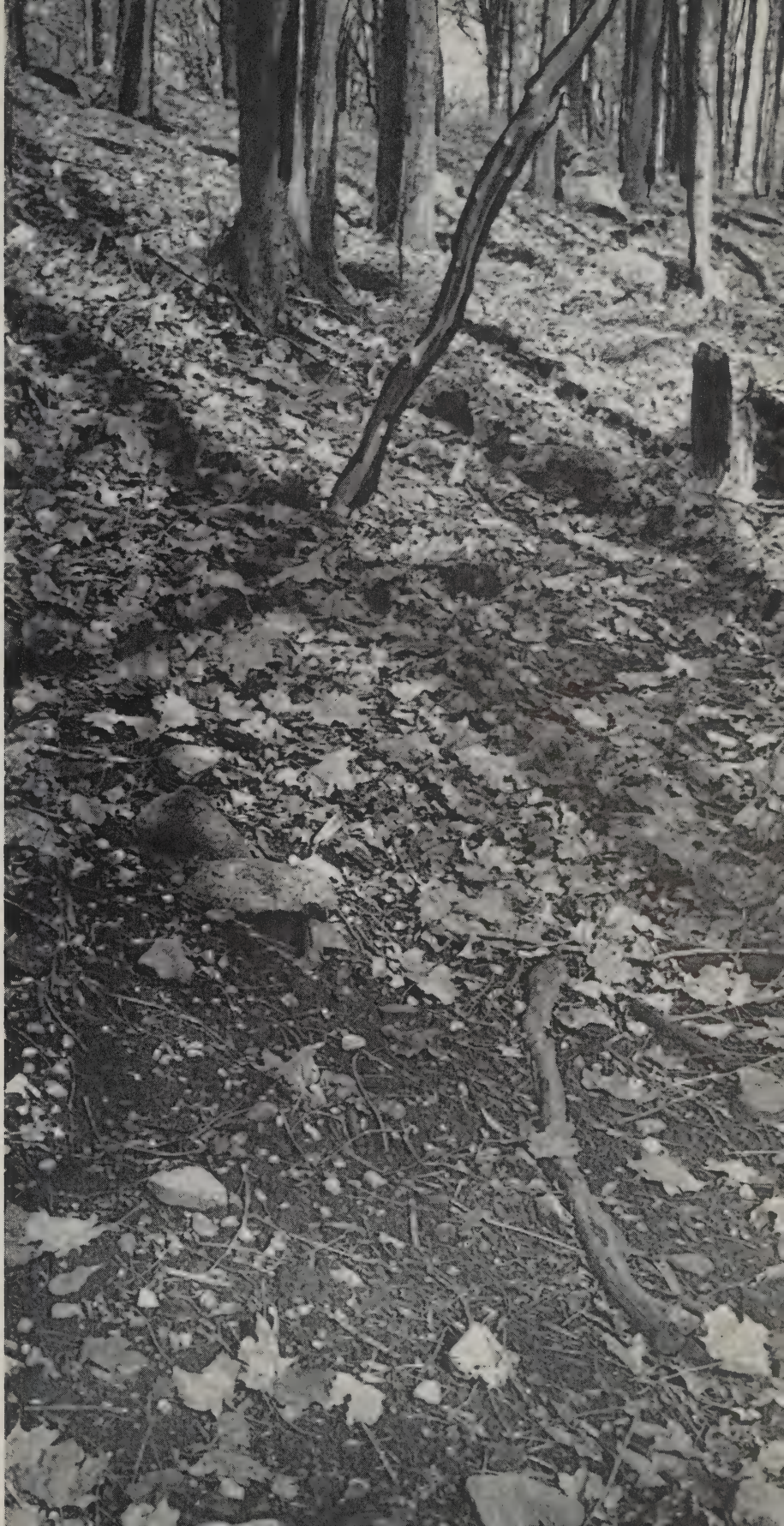
the County Agricultural Representative, Mr. E. I. McLoughry at the Department of Agriculture, Galt. Mr. McLoughry will direct both field and educational activities and act as liaison officer between the local committees and the farmer co-operators and the technical advisory officers of the Agricultural College and the Minister of Agriculture for Ontario. Working with Mr. McLoughry will be the County Council's Committee on Reforestation and Soil Conservation, the County Crop Improvement Association, the County livestock associations, the County Plowmen's Association, the County Federation of Agriculture, the personnel of which is drawn from municipal officers and the leading farmers in the County. For the purpose of aiding in the establishment of the demonstration projects, preparation of educational materials, holding special meetings, etc., the County Council has granted an appropriation for the year and this is being augmented by an appropriation from the Provincial Department of Agriculture.

One of the features of this plan is that advantage is being taken of the already *established organizations in the County* to do the development work and *no new organization is being set up* to duplicate or interfere with existing agencies. The advantage of this is obvious. The County Agricultural Representative probably knows personally more farmers in his county than any other individual officer of the government services. His County committees are composed of active farmers who are known and respected as leaders in their respective communities. These men have the confidence of their neighbours and can carry the gospel of soil conservation to the people at large more effectively than can any so-called experts from some outside agency. It should be noted, too, in this instance, that in order to become fully conversant with what the U.S. Soil Conservation Service is doing, last season Mr. McLoughry and his Reforestation and Conservation Committee, accompanied by district soil conservationists, toured soil conservation districts in Michigan and Ohio, visited typical farms, conferred with owners, district supervisors and others to get first hand knowledge of how successful programmes had been organized over there.

A second feature of the Waterloo County programme is that it has been *planned to meet the special needs* and *types of farming in that County*.

Broadly speaking, the soil map indicates that the County may be subdivided into three problem areas: (a) the northwest area, of smooth to flat topography, with poorly drained, heavy soils of poor physical condition and generally low fertility; (b) the central area of rolling to hilly topography, with well drained loams and sandy loams predominant, low organic matter, general sheet erosion, mineral deficiencies very common; and (c) the northeastern area, of smooth topography, moderate drainage, silt loam and loam textured soils, low in organic matter and lacking minerals, little or no erosion.

It is impossible to have a good woodlot and cattle on the same piece of land. Cattle devour all reproduction, injure saplings and roots and destroy the humus covering of the forest floor.



The programme includes:

(1) An organic matter (humus) survey to provide definite data on the status of representative farms;

(2) Soil conservation demonstration projects on selected farms in each township;

(3) Erosion study plots for measurement of soil losses;

(4) Crop rotation adjustment projects;

(5) Drainage improvement projects;

(6) Pasture improvement projects on land not suited to rotation cropping;

(7) Reforestation and woodlot management projects on private and publicly-owned lands (already established programme);

(8) Educational meetings in each school section, to be organized and held by local committees;

(9) Collection of photographs of local landscapes, improved farm practices, etc., and preparation of educational exhibits for the schools;

(10) Preparation of films and slides for projection at educational meetings in schools and for loan by community groups.

The basic theme which the educational meetings will stress initially is the fertility maintenance problem. Emphasis will be laid on balanced crop rotations and the most efficient use of livestock manure and legumes in the rotation to maintain organic matter; the use of cover crops and green manures to supplement manure and legumes for more quickly building up badly depleted soils; the necessity for adequate supplies of calcium, phosphorus and potash in the soil in order to grow legumes successfully; the necessity for phosphate and other fertilizers to replace the losses of mineral nutrients in the sale of crops, livestock and livestock products; time and method of application of fertilizers; the relationship of mineral supplies in the soil to the nutritive value and mineral content of crops and the relationship of health and reproduction of livestock to quality of crops and the fertility of the soil. These problems are common to all of our cultivated soils; they are problems that the farmers themselves are asking for assistance with. These are the problems of which they realize the full significance and are ready to do something about. These are problems, too, for which we have already the necessary information for their solution. The answer lies in a programme of action. We have hopes that the type of organization we have in Waterloo will get that action, back on the farms where the programme has to be applied if it is to accomplish what we have in mind.

What is being organized in Waterloo County can be duplicated in any other county and yet the pattern can be made to fit the cloth. The demand for the programme should come from within the county, from the people who want the help and are willing to co-operate by doing the job which must be done and which, finally, only they can do. They should decide what their problems are and whether they are willing, individually and collectively, to do something about them. This is a necessary prerequisite to the establishment of a successful county or area programme. A programme of the type described does not displace or detract from the more ideal farm planning projects referred to at the beginning of this paper. Rather, it is intended to lead directly into the completely planned land use programme as its ultimate objective. It is, in essence, the candy coating on the pill.

Previous conferences have emphasized the advantages of the natural physiographic unit of the watershed or the river valley as the unit area for planning and projecting conservation programmes. The validity of the claim is recognized, yet in presenting the idea of a county soils programme there is not any fundamental conflict of method or objective. For agricultural lands, all land use programmes are reduced finally to suit individual farms, whether they are sponsored by river valley authorities or county committees. It would seem that the county unit, with its ready-made organizations, long experienced in agricultural activities and established connections with the farmers, should not be overlooked as a working medium for sponsoring the soil conservation farming programme.

A LAND USE SURVEY ON THE ETOBICOKE CREEK

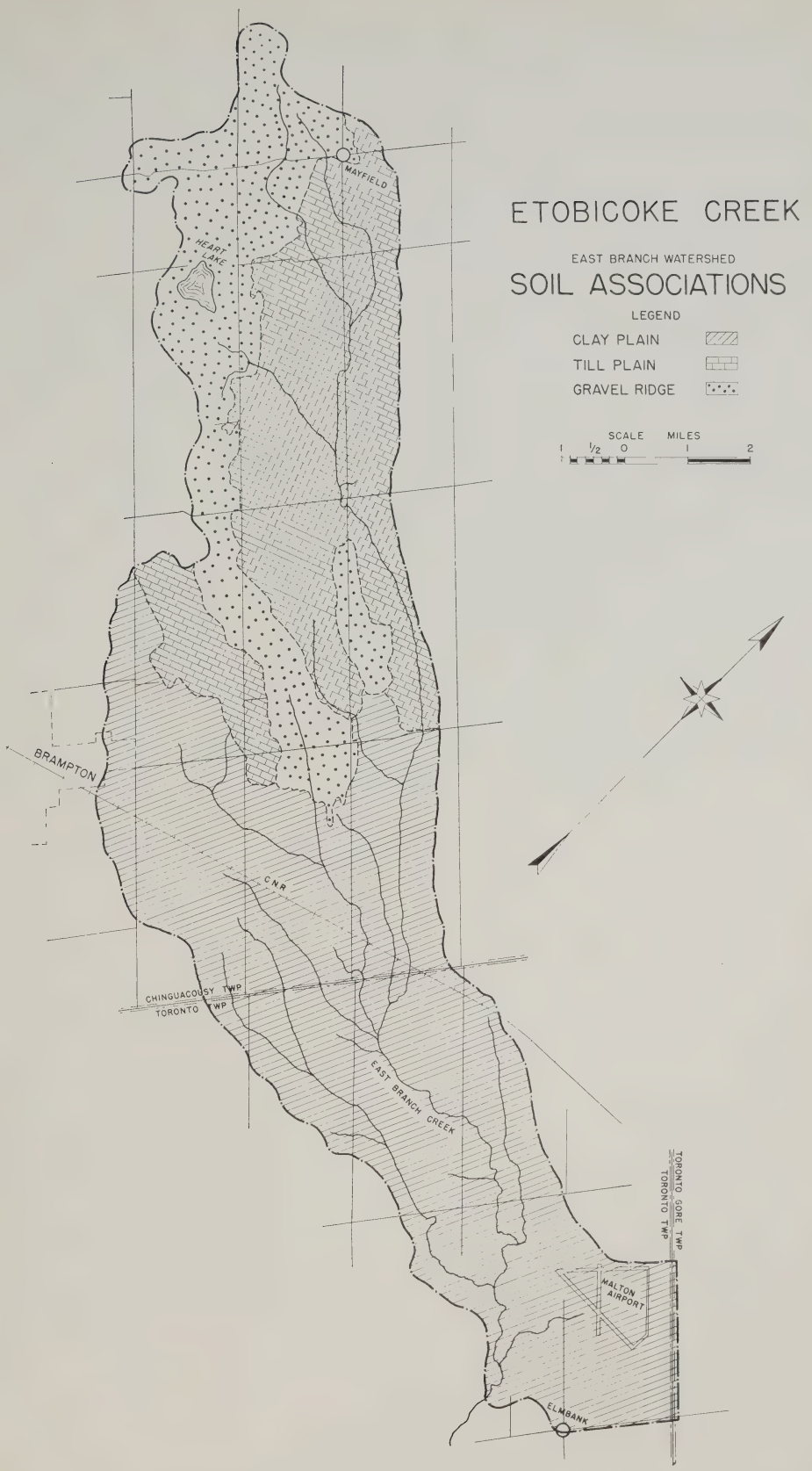
W. J. P. Creswick
Department of Planning and Development

THE common interest that both town and country folk have in the land makes an appraisal of our soil resources a matter of serious concern to each. The question may be raised: "Are we exploiting our land or are we developing it, are we predators or husbandmen, do we live OFF the land or, as a community, can we be truly said to live ON the land?"

Is there a method by which we can assess the condition of our soil heritage? Yes, soil science has devised such a method and we can measure our position in this regard just as readily as the geologist assesses our mineral wealth, the forester our forest wealth and the engineer our resources of water. This method has been adopted by the Conservation branch of our provincial department of Planning and Development. The body of knowledge of soils already accumulated by the Ontario Research Foundation and the Ontario Soil Survey, and the advice of a growing body of specialists at the Ontario Agricultural College constitute the basis for implementing a soil conservation survey. This type of survey has now been carried out on the watersheds of five of the rivers of Ontario. Those familiar with our countryside will not be surprised to learn that our soil has been lost to us to a measurable and very significant extent.

If the soil has been lost to us, in what way are the changes observable and in what form has the loss taken place? There are three main losses, those of fertility, of soil organic matter and of the soil body itself. The loss of soil organic matter can be considered the most critical. The study of soil fertility as a branch of applied chemistry has long been an important feature of scientific agriculture and has reached a high and general state of efficiency and effectiveness. The loss of the actual body of the soil, which we call erosion, though observed quite early in the history of the province, has been a subject of exact study only in recent years and in these studies we have profited from the investigations of others.

Loss of humus content of the soil goes on naturally at any time through the gradual oxidation or burning up of the organic matter and its dissipation into the air as nitrogen and carbon dioxide. Under natural conditions humus is returned to the soil by the plants which grow on it. Under conditions of cultivation and crop production much of the organic matter is removed from the surface in the form of agricultural products. Unless intensive steps are consistently maintained to return much of this to the soil, organic content soon diminishes. This is critical to the maintenance of both fertility and the soil body.


ETOBICOKE CREEK
EAST BRANCH WATERSHED
SOIL ASSOCIATIONS
LEGEND
CLAY PLAIN
TILL PLAIN
GRAVEL RIDGE
SCALE MILES
1 1/2 0 1 2
MAYFIELD
HEART LAKE
BRAMPTON
C.N.R.
CHINGUACOUSY TWP.
TORONTO TWP.
EAST BRANCH CREEK
TORONTO GORE TWP.
TORONTO TWP.
MALTON AIRPORT
ELMBANK

The nature and extent of erosion and loss of soil humus can be determined by observing the soil profile or section. When the wearing away of the soil body by the action of wind and water takes place at a rate faster than the soil building processes can replace it the soil horizons will disappear from the surface downwards. By making a cut into the soil or by drilling it with an auger and removing samples at successive depths we can readily see the extent to which this has gone on.

The chief types of erosion observable in this part of the province are "sheet" and "rill" erosion by water, or what the farmer calls "wash". Gully erosion and wind erosion also occur. This erosion removes the topsoil and deprives the plants of their optimum medium for growth and lessens the soil's water absorptive and retentive powers.

Soils which do not exhibit an appreciable amount of erosion may, nevertheless, be susceptible to erosion by reason of their slope or their texture. Remedial steps that will check erosion are as applicable to them as to those soils which have already been eroded.

The loss of soil, through both erosion and depletion of humus, affects both country and city dweller. Loss of soil productivity lessens the farmer's income and in time may depreciate the nutritive value of the products he grows. The same action has an immediate and direct result on the water relations of the land. The eroded or worn soil does not absorb and retain the water which falls upon it. While the town dweller is paying for the results of the flood which flashed downstream in March the countryman feels the loss of his water supply for his cattle through the lowering of the water table.

In studies made of watersheds in this province it has not been feasible to examine all the land in detail to measure the extent of erosion. In watersheds such as that of the Etobicoke Creek it has been found useful to select an area drained by one tributary of the stream. This area is chosen with regard to the main physiographic regions of the watershed, soil types and land uses so that a fair representation may be made of the conditions to be found on the watershed as a whole. For the Etobicoke Creek the tributary was chosen which arises north-east of the town of Brampton, crosses number seven highway some two miles east of that town and joins the main stream just west of Malton Airport; this we can call, for convenience, "the East Branch".

The men who made the actual physical examination of the soil were senior students and graduates in Agriculture, the Biological Sciences, and Geography in Ontario Universities. In the field they were equipped with soil augers, hand levels and aerial photographs of the area to be studied. With the auger, which is a one and one-half inch auger mounted on a steel shaft, they examine the soil profile to any depth up to three feet, identify the soil type and drainage, and estimate the degree of erosion. With the hand level they measure the class of slope of the land. Every piece of land that exhibits the same soil type and internal drainage, slope,

Mild erosion. Clay loam soil of the till plain supporting a crop of hay. This is on a four per cent slope and erosion has already eaten well into the topsoil. Contour cultivation can slow down the process of erosion.

and degree of erosion is mapped by a boundary line on the aerial photograph which provided a base map of a scale of 1,000 feet to the inch. Fence lines are marked on the map and the use of the land included within field boundaries is indicated; cultivated land, permanent pasture, and woodlot, also wasteland and land put to special uses such as gravel pits, urban development or recreational purposes. Surface drainage, continuous or intermittent and bodies of water are also mapped. When these observations are checked and indelibly inscribed, measurement can be made of areas of each land type and land use, and correlations made between land type and land use. We then have an inventory of our land resources in the area that has been studied. This, in detail, is embodied with observations on flood control, forest development, wild life resources and potential recreational areas in a conservation report.

Some general observations may be made at this point on the soils and land use in the area described as the watershed of the east branch

Water loss. This stranded muskrat house illustrates the great loss of water from the gravel ridge. Conservation practices can restore water to areas like this.

of the Etobicoke Creek. Also, to illustrate the kind of measurement that can be made, a few figures can be given which show the degree and extent of erosion which has occurred.

The area studied, amounting to 12,384 acres, contains soils which can be arranged into three groups or associations according to their physiographic origin. In the north lobe of the area and extending in a belt down the middle is a hilly, gravelly formation covered by light glacial till deposit that gives rise to loam soils. This division, which included small areas of other land forms such as muck, bottom land and gravel pits, amounts to 2,676 acres. Flanking this is a division of the area containing heavy till loam soils, the result of a ground morainic deposit giving a heavy clay loam with a mixture of small flat shale stones. It tends to be imperfectly drained and to give what farmers call a "cold" or "sad" land. This amounts to 3,237 acres. Covering the south half of the area are soils developed on what is best described as a bevelled clay plain or lacustrine deposit. In this region the heavy till deposits have been smoothed off and covered with clay by the action of a glacial pond. The heavy textured clay and the level topography tends to produce an

No erosion. Light, loam soil of the gravel ridge when level and not eroded helps to support fine herds like this.

imperfectly or poorly drained soil. This division of the area amounts to 6,471 acres.

Farming on the clay plain, which has quite fertile soils, was, for some fifty years in the last century, devoted largely to the production of grain. Poorly drained soils are made suitable for this type of cultivation by underdrainage with tiles and the construction of open ditches. The present land use is for the production of whole milk for the Toronto market. This calls for a larger proportion of hay and pasture and there is less need for tile drainage and little is done now. Within this area there have developed highly specialized stock breeding farms, and cattle from some of these farms are sold at premium prices all over the world. On this clay plain it was found that 2,989 acres, or 46.3 percent, were not appreciably eroded, 2,784 acres or 43.3 percent, were moderately eroded, that is, some of the topsoil has disappeared. Thirty-five acres, or 0.5 percent has been seriously eroded; this is on the steep slopes leading to the watercourse itself. Six hundred and sixty-three acres, or 9.9 percent are included in other land forms, chiefly bottom lands adjacent to the stream which is widest at this point. Where grain and silage corn are produced or specialized agriculture is carried on such as orchards, garden, and berry growing, underdrainage is required. Without adequate drainage systems the production of grain entails a certain risk in wet years.

Surface run-off adds to the water in the Eotbicoke Creek and if, to the advantage of agriculture, these soils are kept clear then there is emphasized the need for retaining water in other areas.

The soils of the heavy till loam association also support a prosperous agriculture. Whole milk is produced here as well but not such a large proportion of the land is devoted to it. The wet nature of the soil is mitigated to a great extent by systems of surface drainage channels which are, for the most part, consistently maintained by the farm operators. There is less risk to grain production on these soils and hay and pasture production is good. Owing to the undulating and hilly aspect of these soils, erosion has occurred. On the 3,237 acres examined, 1,634 acres or 50.5 percent were found to have no erosion; 1,576 acres were moderately eroded, that is, 48.5 percent; none was found seriously eroded, and one percent of this division includes muck and bottom land.

The area of light till loam presents a contrast to the other two. The gravel ridge on which the soils have been produced makes the terrain hillier and the soils lighter. They are subject to erosion, and it was found that 1,467 acres or 55 percent have been moderately eroded, 431 acres or 16.1 percent have been seriously eroded and only 205 acres or 7.6 percent have no appreciable erosion. Five hundred and seventy-five acres, or 21.3 percent of the area, are included in muck, bottom land, gravel pits and bodies of water. Some of the better land, though susceptible to erosion, could bear increased production, without depreciation of the soil, if conservation methods of farming were practiced. Farming is less specialized on these soils; much of their area is in permanent pasture which is either rented out to milk producers or is used for pasturing beef cattle. The maintenance of effective sod cover on the most vulnerable of the agricultural lands is essential to its conservation and rehabilitation. A systematic application of expert knowledge of grass and legume mixtures and improving these lands by fertilizing and suitable cultivation should make them productive without further depreciating the soils.

Some special forms of land use are seen on this formation. Also some important features of water relations are seen. These indicate the future management of this land. Mention may be made of a duck ranch which is operated on the lake included within the ridge near the source of the stream. Extensive workings have been carried on to remove gravel from the hills for road building. When the gravel has been removed the land is of no further agricultural use but its importance as a source of water supply remains.

The water which falls upon these light soils is removed in three ways. First, in the form of surface run-off. This augments flood conditions downstream and aggravates the conditions of erosion locally. Second, in springs which are fed by the water rapidly percolating through the gravelly material. This water comes out of the ground on the lower slopes

Severe erosion. A light loamy soil of the gravel ridge on irregular slopes over 25 per cent. Erosion has removed all the topsoil and most of the subsoil. The present crop of grain exposes this to further erosion.

where the lighter soils contact the heavier ones. These springs are valuable to the farmers for watering cattle and also maintain the stream flow throughout the summer. This stream is the only one of the Etobicoke Creek system which flows the year round and is vital to any wild life or recreational development in the district. The third outlet for this water is in the wells which supply the town of Brampton. Further diminution of the ground water supply may affect this use and protective measures would then have to be taken.

The control of run-off can be achieved in three ways: by the practice of conservation farming, the maintenance of sod cover and the planting of forest cover. All three can be done with profit to all and with assurance of lasting benefits, in the preservation of our soils and our water supply for agricultural, town and recreational use.

In this area, on the edge of a rich agricultural region and close to the

City of Toronto, there is exemplified that community of interest of town and country folk alike. The land that produces the milk and meat for our families is also the land, accessible to us, where our children can derive that moral nourishment found only on the land itself. The extent to which we have preyed on that land can be measured. The steps by which we can reach that nice balance between the land and the people who live on it can be traced when the knowledge and skills that are available are used.

ETOBICOKE CREEK

TABLE OF EXTENT OF EROSION ON WATERSHED OF EAST BRANCH

Soil Association	No Appreciable Erosion		Moderate Erosion		Serious Erosion		Other Land Bottom Land, etc.	
	Acres	%	Acres	%	Acres	%	Acres	%
Light Till Loam—2,676 Acres	205	7.6	1,467	55.4	31	16.1	573	21.3
Heavy Till Loam—3,237 Acres	1,634	50.5	1,576	48.5	Nil	....	37	1.0
Bevelled Clay Plain—6,471 Acres	2,989	46.3	2,784	43.3	35	.5	663	9.9

ADDRESS

Col. the Hon. George A. Drew, K.C., LL.D.
Prime Minister of Ontario

MR. CHAIRMAN and Ladies and Gentlemen: When Mr. Porter spoke to me some time ago about the Conference that it was proposed to call, I assure you that I accepted with great pleasure, because, as has already been said by your Chairman this evening, I have been very interested in, and very keen about the possibilities of some co-ordination of our planning activities in just such a manner as has come about through the various organizations you represent.

I assure you that I do not intend to deliver a technical address upon any aspect of the problems that you are discussing. You have met to hear papers by experts in various aspects of the problem under consideration and I wouldn't presume for a moment to either attempt to gild the lily, so far as they are concerned, or to pretend to come here and be regarded in any way as an expert in that field.

But I think that perhaps I might deal with one aspect of planning and conservation which it seems to me is fundamental to the approach that we make to this whole problem. Conservation, such as is set forth in the list of activities of this conference, is planning of a very high order, and it seems to me it is essential that we decide just what kind of planning for conservation or for anything else it is that we want.

There are those who feel that, unless there is some authority who can with finality and complete power say that this or that will be done in any particular place, there are no plans. It is a rather popular idea in certain parts of the world, and perhaps not very remote even from our own surroundings, to look to some authority, and often the more distant he is the more mysterious he becomes and the more impossible it is to look to some authority to say what will be done in every community.

Speaking as the head of the government in this province, which must, after all, assume some responsibility, and which seeks to cooperate in this activity as much as possible, may I say most definitely that our concept of planning is that we should make sure that the local municipal bodies and the voluntary organizations within the municipal areas retain and exercise full control over their own affairs. We base that upon a very simple and, I hope, not misguided belief, that the closer government is to the people the better and more economical is that government. After all, our whole system of development in this country has grown up from the strong basis of local government and from the direct contact of people in each community with their own affairs.

Having said that, please don't think for a moment that I am suggesting that the Government of Ontario, or any other government, should

divest itself of responsibility for doing all within its power to stimulate interest. I use the word "stimulate" of course in its restricted sense, in the full development of every type of planning which is in keeping with the accepted wishes of the people in those communities.

I would say we had come to a very unhappy position in our affairs if we ever decided as a people that any community was going to abandon its own ideas of what kind of a community it wants from the point of view of the general appearance of the buildings and the highways and so on, which it constructs within its borders. I have no blind faith in remote experts who have no continuing responsibility for the production of their plan in the community where the plans are put into effect. I then go on from that point to say that I don't think that communities, however, will produce the best results if they do not associate themselves with other communities and through that association and through the exchange of ideas, gain the full advantage of all that is taking place in other communities, as well as their own. It is for that very reason that conferences of this nature and wider conferences have such a very real value.

If I may sum up these remarks, and please don't get too hopeful because I haven't yet come to the point of summing up all I am going to say, but if I can sum up these remarks so far, I may do it in this way: I believe the planning for conservation which is proceeding with a very high degree of vision and with very real hopes of a broad field of achievement, if that is to go ahead on a truly democratic basis, then I think it must go ahead upon the voluntary cooperation of all the component municipal units that are within that area and within any area with which we are dealing, and that the time has not yet come for local governments to abdicate their authority to provincial governments, nor, shall I say, for provincial governments to abdicate their authority to a still more remote central government.

Then, Ladies and Gentlemen, coming to the question of conservation itself. We are perhaps a little inclined to be very free in our criticism of those who have failed to envisage the possibilities of a destruction of much of our great natural resources. We look around and we see the very real deterioration of soil in certain areas and very substantial loss of trees and crops. We are perhaps very critical of those who have permitted that to happen.

Let us keep our perspective in this. After all, just a little over a hundred years ago this province and this very area was emerging from the forest when trees were actually the barriers to development instead of the essential protection of the natural source of moisture and of the soil value. Then the people's whole attitude was one of driving into the forest and breaking the forest open and extending the development of urban areas and ultimately of great industrial centres. It is only natural in that tremendous expansion that has taken place in less than a hundred years—and that is a short, short time in the history of any nation—it is

only natural that we should have devoted our energy to the expansion of our productive powers, without devoting too much of our thought to some of the things that were happening while that was taking place.

We have reached a point where we see the need for conserving these great natural advantages. We see something more. Actually, when we talk of conservation we are frequently really talking of restoration. In the Toronto area there is much restoration to be done, as well as conservation, but it can be done, and with a long-term vision and with planning as to the type of community we desire, there is no reason at all why we cannot restore those natural advantages which nature has endowed us with so generously.

There is much emphasis in the discussions which are taking place on the recreational aspect of the conservation plans. That, I believe, is of the utmost importance. We now have here a great urban area in the City of Toronto. We have other urban areas, large though not as large as Toronto, throughout Ontario. The natural desire now is to surround and incorporate with that tremendous material and industrial development the comforts and recreational facilities that come with maturity.

After all, our position is very much the same thing as one sees in any newly opened area. Go to any place where men have opened new lands. First, you see the log cabin or the hut settlement. Then as more land is opened and production increases you see a better house, but not much devoted to the softer, attractive things of life. It is a purely utilitarian place to live. It is only finally, when the place becomes a stable source of continuing production that they devote themselves to the thought of a permanent, attractive, comfortable home.

We are the same in communities. We have reached that point. We have come of age as a nation. We have reached a stage of maturity when it is natural and proper for us to incorporate with our other developments all the recreational facilities that will make this, too, a finished, attractive community, both here and in the surrounding country.

Those of us who had the good fortune to know the British Isles well, and part of Europe, can't help comparing in our minds the picture of a whole country that looks like a great garden and then, as we see things here, realizing that with all the beauty, with all the richness of our soil, there is still an unfinished appearance, as compared with any part of England, Scotland or Wales.

There is no reason at all why the country surrounding Toronto and the parts of the municipality in this area, can't have all that finished appearance of any part of the countryside of England. You may say, well, we have a longer winter. That is true. That doesn't mark the difference. It is just that we have decided that this is our home, a great community home in which we are going to tend our gardens and finish off

the appearance, just the way that we do with our own gardens and our own homes when we find that that is the place we are going to live.

Then I think also that there is an aspect of this planning that we want to look very carefully into, so far as the future is concerned. This Department of Planning and Development, insofar as the planning is concerned, was not intended—and that is the point I sought to emphasize—it was not intended to be an authority which would dictate to any community what was to be done there, but would merely be a public body which would stimulate interest, furnish such advice as was sought, and could be given, and would be a means of cooperative action, both between municipal authorities and by public bodies in those municipal areas. I believe it has achieved much along that line. The many plans that are emerging are themselves evidence of actual achievement in that direction. But that Department has another important function and one related to the question of planning and the recreational facilities that we are discussing. It is the Department of Planning and of Development, and that development is development in respect, not only of conservation and of water protection, and so on, but of the development of industrial areas. Through the channels of that Department many new industries have come into this province. A great many more will be coming into the province, and in that way creating increased employment throughout many parts of Ontario. But as the new industry comes in, we again immediately come to the question of the effect of those industries upon the areas where they go, and the facilities that will be available for them.

With no criticism of the past, but having reached maturity and anxious to avoid the natural mistakes of our youth, as we plan to bring these new industries into our communities, let us make sure that we don't repeat the mistakes and that we do insist upon adequate protection of our natural topographical beauty and recreational areas when those factories are put up, so that not only will existing facilities be retained, but that people who come there to work in those factories, those new industries, will also find attractive places to live.

So our planning should not merely be done to conserve what we have and to beautify what is there, but to create our broader plans, so, as industry settles and creates new employment, that those who live there now and those who will come in there may have added opportunities of recreation and of pleasure.

Then I think we may learn one thing that has been learned in Britain during the war. Because of the danger of bombing, and only for that reason, there was an enforced decentralization of industrial production. They were prepared to forego what they regarded as industrial efficiency and cost factors so that the danger might be minimized of the wiping out of great plants producing vital war needs. They actually found, instead of costing more or of being less efficient, that production was cheaper and more efficient in those decentralized plants,

because of the more pleasant conditions under which the people who were working in the factories were then living. There are many in this room who were in Britain during the war who have seen those new factories, scattered throughout the British Isles, and have talked to the people there, and who know how very unwilling they would be to go back into the urban areas, with the great concentration of population, as compared with the attractive surroundings throughout the countryside where the factories have been developed, with good houses and efficient busses and trucks and all the opportunities of communication by telephone and other means. The separation of units of industry and the decentralization of industry itself no longer presents some of the problems it did a few years ago.

Not as an expert, but simply as one very much interested in the beauty of our own countryside, I would hope that we would learn a lesson that was not forced upon us in the same way, and that we would spread our industrial production as much as possible, so we can have as much room for homes as possible without having them overshadowed at all times by an ever-increasing number of factories.

By that I do not mean for a moment to hold back new development. No, let us expand it, but recognizing the great flexibility of our electric resources, spread it around so that we are better able to expand our industrial production and retain the beauty of our communities, both urban and rural.

I am just going to make a few additional remarks before sitting down. To-day, Democracy, a simple and an abused word, is on test throughout the whole world. Real Democracy has not been increasing throughout the world in these past few years. It has actually been decreasing. There are only a comparatively few countries in the world to-day where there is real Democracy. This, thank God, is one of them. For that very reason we have a challenge, not only for our own satisfaction, to do these things well, but we have a challenge to prove that under a free democratic system we can plan and work for our mutual advantage, as well—yes, and better than any of them under any other system of government that has emerged in the world during the past few years.

That is the test. The answer will come, not from our verbal argument, but from what actually results. If we make Democracy work, Democracy will grow in strength. If it fails, then it may not only fail but perish here, as elsewhere.

But Democracy, Ladies and Gentlemen, is a positive, vigorous thing. It isn't a negative and it isn't made up of always finding the things that can't, it is made up of finding the things that can be, and then doing them as a free people.

Democracy can only be Democracy if there is cooperation. There can only be real cooperation under the kind of freedom that we have,

because in anything else than freedom there is not cooperation but enforced submission.

We have here in this country unparalleled opportunity. Nothing yet has reached the point where we need unduly regret the past. By careful planning now, by conserving what we have, by restoring what has been done, by working with vision as a free people, with all our difference of opinion and detail, joining hands as Canadians and as citizens of this province, we can really prove, as it is given to few people in the world, we can really prove that Democracy will work.

The fact that this is not our task alone is demonstrated by the courtesy extended here in the presence of one of those who will give a lecture—our friend, Professor Van Camp, of Purdue University. I mention his being here because of the fact that in addition to the advantage he will give of his experience in what he will tell you, he is here as a representative, not official in any capacity, but as a representative of that great, friendly country which lives on such friendly terms with us and with the British Commonwealth. Everything I have said applies with equal force to them. Everything they are trying to do applies with equal force to us. So we are given this opportunity to exchange ideas, not only in our own areas, but across those borders as well.

It is a great thing for us, a challenging thing. Out of these very conferences and out of these meetings I believe we are building the foundation of a great Democracy in the years ahead.

MAN'S EFFECT ON ONTARIO STREAMS AND FISH

By Dr. A. G. Huntsman
Fisheries Research Board of Canada

THE settlement of parts of Ontario by men from Europe was sufficiently rapid and thorough to show clearly some of the effects upon the streams and the fish, as is well illustrated in South Central Ontario. It is unfortunate that the records of this are so meagre.

The main factors are, however, clear. Cultivation of the land has had, as its associates, very thorough drainage and rapid removal of the soil by the water that drains away. This has made the streams muddy and more variable in flow, higher after rains and lower in a dry season. The decrease in underground water and flow from springs seems to have been considerable ("Dessication in Southern Ontario", A. F. Coventry, Trans. Roy. Soc. Can., vol. 34, sec. V, pp. 15-23, 1940), so that many streams are now only temporary. Two important animals that lived in the streams disappeared. The beaver, whose skin served as currency and which Sir Sanford Fleming used in his design of the first Canadian (Upper and Lower Canada only) postage stamp, is now restricted to unsettled districts. The salmon, which was so abundant in streams flowing into Lake Ontario that settlers paid for their farms by catching and selling it, has survived only in streams of the lower St. Lawrence and of the Atlantic coast. The former may be said to have been directly eliminated by capture, though not the latter, but doubtless the former would not have survived in thickly settled districts, even if it had not been captured.

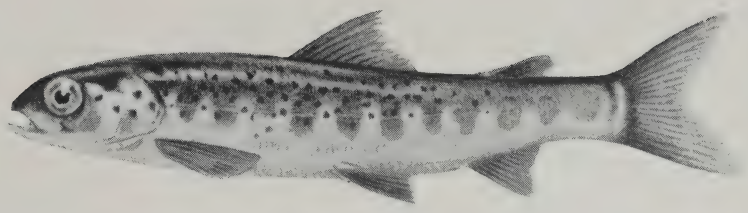
European man, on coming to this continent, found the same salmon or "leaper" as the name means, as in the streams of his home land. It lived in Lake Ontario and tributary streams, ascending the latter mainly in the fall, and being so numerous that over a thousand were often caught in one stream in the course of one night. They reached over forty pounds in weight. Some ascended the larger streams, such as the Humber and Credit Rivers, west of Toronto, early in the season, being taken regularly in March, which is much earlier than they are to be found on the Atlantic coast, except occasionally in southwestern Nova Scotia.

While disappearance of beaver and salmon are to be regretted, no one would seriously maintain that, to prevent their disappearance, the country should not have been settled, or that it should now be returned to its original condition. The real question is how can we get beaver and salmon back, if we want them. Samuel Wilmot, who was the father of fish culture in Canada, saw the salmon disappearing from his creek at Newcastle through the middle of the last century and tried to stop them from going by hatching their eggs and planting the young, but he failed. It is now clear that too little was known about both the salmon and the conditions in the streams for his attempts to succeed.

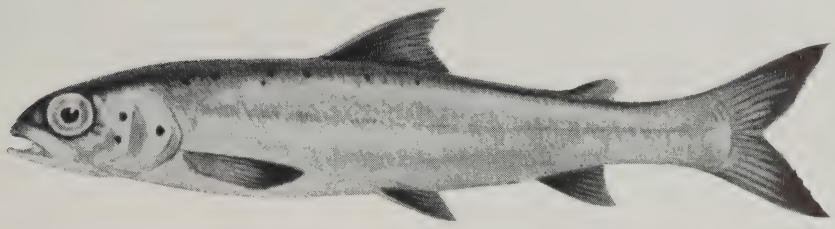
Salmon fishing by torchlight in pioneer days.

If we are to have what fish we wish to have in the water, we must learn how to get them there. This is very far from being easy, but man has accomplished so many difficult feats by long and arduous effort that this heavy task should not daunt him. The great complexity of the matter has been largely unappreciated.

With the advice of a group of fishery scientists at the University of Toronto and with the background of investigations on planting of salmon in the Petitcodiac River, N.B., by the Fisheries Research Board of Canada, the Ontario Government is trying to find out whether streams flowing into Lake Ontario can still produce salmon. For the last three summers, the Fish and Wildlife Service (formerly the Department of Game and Fisheries) with the cooperation of the Ontario Fisheries Research Laboratory, has been planting Duffin Creek above Pickering with fingerling salmon and following the result. Eggs were provided by the Dominion Department of Fisheries from its Miramichi hatchery in New Brunswick and hatched out at Glenora. Duffin Creek was one of the streams to have many salmon as late as the Seventies, when even a forty-pound fish was seen in it. H. R. McCrimmon, B.A., F. T. Knapp, B.A., and D. H. Pike, B.A., of the University Department of Zoology,



Salmon Parr. The parr has vertical bars on the sides and has red spots like a trout but it also has black spots, particularly on the back, and a fairly well-forked tail.



Salmon Smolt. The smolt has a silvery coat which covers the bars and red spots, though some of the black spots can still be seen, and the tail is well forked.

are studying the fate of the salmon, the food for fish and the kinds of fish respectively, with a base at Greenwood on the east branch of the stream.

Each year about 40,000 fish have been planted generally throughout the branches of the stream to see where they would survive. Atlantic salmon usually spend two or three years (as much as eight in northern Labrador) in streams, before becoming smolts in the spring when four inches or longer, and descending to lake or sea. None or very few are surviving in the heavily silted lower waters. They are growing rapidly in the warmer waters, some seeming to become smolts even in one year, but in the cool spring water, where trout abound, they are growing slowly.

The very earliest that any could be expected to return from the lake would be this fall (1946) as grilse of two to three pounds. A forty-pounder would take at least ten years to grow. Will they survive and return to Duffin Creek or enter other streams? Can they spawn successfully? It is believed that they disappeared, partly because they were kept by dams from reaching spawning beds, but perhaps mainly because silt from cultivated land clogged the beds and smothered the eggs. ("Why did Ontario salmon disappear?", A. G. Huntsman, Trans. Roy. Soc. Can., vol. 38, sec. V, pp. 83-102, 1944.) Artificial hatching and planting of the young may be necessary to maintain the stock.

The lower reaches of Duffin's Creek, like most small streams in Southern Ontario, has had the protective trees along its banks removed with the result that the water has become too warm for trout and salmon

Even the dark-barred young salmon or parr take the fly, but capture should await return from the lake. They formerly entered Duffin Creek only in the fall and the Humber River in both spring and fall. They take the fly only when the water is cool. In the Maritimes they provide fine sport as late as October, and anglers from as far away as Florida go there in early spring to fish with barbless hooks for the kelts (salmon that have spawned) before the latter leave the streams for further growth in the sea.

The knowledge that has been accumulating in recent years gives warrant for the following account of what should be done although whether or not the result would warrant the effort depends upon man's desires, which are scarcely predictable. I wish to affirm that, depending upon precisely what is wanted, we can have in thickly settled Ontario much more abundant wild life than was found by European man when he came here. Dense unbroken forest is comparatively barren of other life in air, on ground and in stream. The streams in some valleys from which man has withdrawn have now clearly less salmon than when the valleys were well settled.

Some of the upper reaches of Duffin's Creek and other streams still have banks lined with cedar and alder which maintain the cool, dark pools where trout lie in wait for their prey.

To increase underground water for wells, for springs and for maintenance of streams, every opportunity should be used to have the rainfall sink into the ground by means of proper conditions at the surface, and to store it in pools, ponds or lakes, particularly in high land and at stream sources. So far as beavers could have for their use the necessary trees along headwater streams they would help with their dams to hold the water back. Wherever feasible, cultivation which exposes the soil to erosion should be restricted to land that is comparatively level with slow drainage, which permits the water to sink in and not remove good soil. This would more or less reduce silt in the streams, which cuts off light and prevents growth of fish food and which clogs spawning beds and smothers the eggs. Dams which prevent movements of migratory fish have now largely disappeared, but for such as remain, if passage of fish is really needed, there should be little difficulty in providing suitable fishways,

The Northeast Margaree River, Cape Breton, N.S. Note the clean gravel beds which characterize the best salmon rivers.

for use only in the appropriate seasons. Instead of removing obstructions to stream flow in the shape of tree roots, snags, logs and brush, these should be deliberately placed in the streams, where there is a good chance that they will remain so as to create as many pools and as much shelter for fish as is possible. Fish soon disappear from open water. Passages should be maintained through sand bars thrown up by wave action on the lake at the mouths of the streams.

Such a program is deceptively simple. It takes account only of such obvious points as (1) that you must have water to get fish, (2) that you must have light in the water to grow food for the fish, (3) that you must have big water or good cover to hold big fish, (4) that you mustn't have eggs smothered if you are to get young fish, and (5) that, if you need to have the fish migrate, you must provide the way. Success will come only, as in any business, from giving all the very many significant details proper attention. Apparently only by continued research, experiment and careful following up of results is there a prospect of success in populating Ontario streams with the fish that are desired.

To illustrate the complexity: Beaver may do harm to fish as well as good, muddying the water with lessened production of food and silting of bottom, and their dams may, with low water, prevent the young salmon

from descending to the lake and spawning salmon from ascending the streams; mergansers, kingfishers and herons, which many people like to have about, may clean up the fish so thoroughly that scarcely any remain. It may be necessary to choose in nature as in your garden which kinds of life you prefer, since you may not be able to have all that you want at the same time in the same place.

DISCUSSION

MR. W. R. SMITH (London): I would like to ask Dr. Huntsman if there has been any effort made to have a closed season on lake trout? At the present time the commercial fishermen are fishing practically the year around and the trout are apparently being exterminated, the same as the salmon were. Last fall I was on my holidays in Manitoulin Island and an old fisherman there told me that they themselves had asked for a year-round open season for trout and that they had made a mistake, that the prevention of the spawning of trout was bringing about their extermination.

I had this told to me by a great number of old fishermen who had retired. Apparently the ones still in the game—there are not many of them left—are anxious to keep the status quo, but the old timers who have retired are willing to tell the truth, and say they made a mistake, and they would like to see the closed season restored during the spawning season.

DR. A. G. HUNTSMAN: I am afraid I cannot say what has been done with regard to the season. That is not my province. But I would say regarding the lake trout it is a very different fish from the salmon in that it does not ascend streams, so the data we have been getting on the salmon are not at all applicable.

However, I believe that the conditions which have not been particularly altered from the conditions they had originally when they came here from Europe are to be studied rather intensively. There has been already some very good work done by Dr. Fry of the Ontario Research Laboratory on lakes up in Algonquin Park in determining how the numbers are kept up, and the fish in them and I will have to leave it to him to state what he has found. There has, in recent years, been very considerable concern expressed over the trout in the north channel of Lake Huron, and to a somewhat less extent, in Georgian Bay, and the Ontario Fish and Wild Life Association has very thorough plans in hand for study of what is responsible for the present condition.

CHAIRMAN PETERS: Thank you. From what I know of the lake trout situation there is a good deal of concern being felt about its rapid decline and I believe that some of the commercial fishermen are beginning to wonder if they aren't wrong. I am happy to say there has been a very, very close cooperation in the last year or two between the anglers and the commercial fishermen. We are sitting together on various committees, we are beginning to find we have a good many mutual problems, the air seems to be cleared a great deal, and I think that perhaps a lot of these things will improve as time goes on.

There is in prospect—perhaps it is what Dr. Huntsman was referring to—a great experiment which will probably be called the South Bay Experiment, named from the South Bay of Manitoulin Island.

It has not yet been approved, but a good deal of study has been given to the possibility of a very large operation there in which practically all the fish will be removed, that is, all except the game fish.

I think the principle is the removal of all fish by the commercial fishermen who will destroy the useless species that are now there, and over a period of years it is hoped that some information will be gained as to how harmful some of these species are.

But I can assure you, Sir, there is a good deal of thought being given to the lake trout situation now.

MR. ERIC W. BAKER: This question is for Dr. Huntsman. There are quite a number here and outside the meeting who are interested in encouraging trout in the Humber and the Don to the extent that it is possible. I don't doubt that the greatest work that is necessary there will have to be done through the conservation authority. In other words, united action to bring about proper conditions. However, pending that, what is it possible for the individual land owner to do? Could you tell in a few words what it might be possible to do within one's property?

DR. A. G. HUNTSMAN: Mr. Chairman, it would be very difficult to say what could be done without local knowledge of the exact conditions. What is rather peculiar about the brook trout in comparison with the salmon, and we have been studying both together in the Maritime Provinces, is that the brook trout seems not only to need cold water but it knows how to get to it, and if there is any chance at all it keeps going until it gets cold water where, of course, it goes to spawn.

The important thing is to take local conditions and see if by any means they may be made suitable for trout.

Further up the stream, you have conditions, perhaps similar to the upper part of Duffin's Creek, where the trout do very well. In some places farther down Duffin's Creek there is good trout water where you again have cold spring water. They do seem to be attracted to the cold spring water, so if an increase in spring flow can be managed by conserving water higher up, that is the sure way of getting trout.

CHAIRMAN PETERS: And then, I presume, providing suitable cover to maintain the lower temperature?

MR. A. H. RICHARDSON: Dr. Ide, who was associated with us this summer, is here and could probably answer that question.

DR. F. P. IDE: I would say during the course of our survey we found that trout are taken quite generally in that part of the Humber which arises on the escarpment, east of Orangeville and west of Mono Mills. Apparently conditions weren't quite suitable for them the year round in that section and from the amount of fishing they dropped further down the stream at the early season and again in the fall.

During the making of the survey we have been considering improvements which might be made to increase the numbers of trout in this type of water. The numbers are rather small because the streams are small and in other similar types of water a great increase in production has been brought about by the construction of small ponds, somewhat of the small mill pond type. Ponds of this type at the head waters are productive of trout, would provide good fishing and would preserve the whole of the water back in this section of the river.

CONSERVATION ON THE FARM PROPERTY

M. A. Adamson
Superintendent Midhurst Nursery
Department of Lands and Forests

CONSERVATION, a half century ago, was almost unthought of in Ontario. At that time, we considered our resources of timber, agricultural land, fisheries, wildlife and mines inexhaustible. We have, in the past, exploited these resources, and today, in Southern Ontario especially, we are beginning to pay the price. It has been shown clearly, in the past, that when we violate any law, economic or natural, eventually ruin, final and irretrievable, overtakes us. We can see the devastating conditions at which a country finally arrives by comparing poverty-stricken, timberless China as it is today, with the heavily-forested Chinese Empire of ancient days. North Africa used to be the granary of the vast Roman Empire. Today, it is practically a desert. The extreme deterioration of soil prosperity was due in large measure to the removal of forest cover in these countries. Southern Ontario, to a lesser degree, is gradually approaching a dangerous unbalance between agricultural soil and forest cover. In European countries where the importance of keeping a proper balance between these natural resources is realized, an attempt is made to keep 20 per cent to 30 per cent of the land in forest cover. The result of an upset in this balance leads to soil deterioration, droughts, floods, erosion (both wind and water) climatic changes and lowering of the water table with the resultant shortage of well and spring water in periods of dry weather. These changes obviously affect the general prosperity and health of the community.

Conservation is usually thought of as pertaining to soil restoration or reforestation. It should, however, be concerned with all resources and the general welfare of the community. It can be practised by the individual farmer but to obtain ultimate success the co-operation of his neighbours will be required. There is no use in planting an area of his farm with trees, if at the same time his neighbour on the next farm is clear-cutting a woodlot which protects the headwaters of a stream or which provides a shelterbelt. Conservation is a project which demands planning and co-operation. It is now recognized that conservation and rehabilitation programmes should extend to a whole region. A region should consist of at least a watershed area. The programme, to be really effective, must have the fullest co-operation and understanding of the individuals and the local municipal bodies in the region concerned, as well as the technical men and the conservation authorities engaged in working out the plan.

Conservation on the country property includes many projects. These would work into the general plan for the improvement of private property in any drainage area under a master-plan development. Some

The growing of trees in a forest plantation is a profitable investment and will yield handsome dividends in the future.

of the projects may be beyond the scope or the requirements of the average farmer but would be a decided asset to a private estate. Many such properties are now being developed, as the love for the soil and outdoor life increases. Projects which will be dealt with are:

Reforestation,
Windbreakers and Shelterbelts,
Woodlots,
Improvement of Streams for Fish,
Protection and Care of Natural Reservoir Areas,
Small Dams,
Farm Ponds, including Fish Ponds,
Conservation Farming,
Game Birds and Wildlife.

Windbreaks and shelterbelts are valuable assets to any farm and farming community.

REFORESTATION

This is the most spectacular part of any conservation programme. When young trees are planted one can actually see the development of the future forest from year to year.

The relation of reforestation to conservation was covered fully by The Hon. E. C. Drury, former Premier of Ontario and an ardent advocate of reforestation, in an address delivered before the Ontario Crop Improvement Association at Toronto, February 22nd, 1939. In this article he discussed the excessive exploitation of our forest cover in the past and the mismanagement of our remaining woodlots and sub-marginal lands in Southern Ontario. The above, combined with poor farming methods, have resulted in the loss of valuable top soil essential to crop growth, and a serious drop in the water absorbing and holding qualities of the countryside. The result is costly floods in spring and excessive drought

and water shortages in summer. Forest cover besides ameliorating floods will also assist in the storage of subterranean water so important to agriculture.

The production of timber, of course, provides the direct monetary return from reforestation. We realize more than ever today, the value of timber as a building material, both on the farm and in our housing schemes. The growing of trees in a forest plantation is a profitable investment and will yield handsome dividends in the future. Such plantations when they become older will also provide employment during the winter season. Products which can be procured from a forest plantation are numerous. These include lumber, pulpwood, posts, poles, mining timbers or pit props, firewood and Christmas trees.

The secondary benefits of reforestation are often of greater importance than the products themselves. These include water control, prevention of erosion, both wind and water, improvement of weather conditions and breeding grounds for birds and wildlife. Last but not least, they increase the beauty of the rural landscape and serve as an attraction for tourists.

Trees for reforestation are supplied free in Ontario by the Department of Lands and Forests. Application forms are procurable at the district offices and Toronto. These forms should be filled out, in detail, and returned to the Toronto office not later than February 28th in the year in which trees are wanted. Trees should be planted as early as possible in the spring and not later than May 24th. They are usually planted six feet apart in shallow furrows plowed six feet apart. The spacing should be eight feet apart if thinning is to be delayed until thirty years of age. The plantation must be fenced to protect the trees from livestock. The Ontario Department of Lands and Forests bulletin number three "Forest Trees for Distribution" should be consulted before ordering, and for detailed instructions for carrying on such work. This bulletin lists the trees available and their site requirements. Conifers as a general rule, should be used where the problem is control of erosion and stream flow.

The southern part of Ontario has been divided into districts with foresters in charge of each who will give extension service in regard to reforestation, woodlot and plantation management and other conservation problems. These districts and sub-offices cover every County in Southern Ontario and should be consulted before undertaking a planting or conservation scheme.

WINDBREAKS AND SHELTERBELTS

Windbreaks and shelterbelts are valuable assets to any farm and farming community. In summer they protect farm crops from undue evaporation and wind erosion. In winter they afford protection by

A well managed woodlot will supply the farm with fuel wood, lumber, fence posts and maple syrup.

preventing wind damage and the removal of snow by wind. They protect farm buildings and houses from the chilling effect of high winds, and are useful for sheltering orchards. They also provide a nesting place for birds. The effect of a windbreak is felt to a distance of ten times its height to the leeward side and twice its height to the windward side.

One or two rows of planted trees constitute a windbreak. When one row is used it is satisfactory to plant the trees six feet apart. When two rows are planted it is recommended that trees be planted eight feet apart, one row staggered with the other. Three or more rows are commonly known as a shelterbelt. The latter is necessary in extremely windy or exposed areas.

Windbreak trees consist mainly of White or Norway Spruce in the case of one row. In the case of two or more rows Scotch Pine and Red Pine are alternated in rows with the Spruce. The trees should be planted in summer-fallowed land so that they can be cultivated for a few years. They can be planted in shallow furrows if the sod is very light but in heavier soils the summer-fallow method is the only planting method to insure success. White Cedar is sometimes planted 18" to 24" apart to provide a lower type of windbreak or hedge.

An additional use of windbreaks in later years has been for permanent snow fences. This method is now being used on Ontario highways and

on county roads. The same type of protection can be used to advantage for farm lanes and boundary roads.

Trees for such work are also supplied free but not for decorative hedges especially on urban property.

WOODLOTS

The woodlots of Southern Ontario are the remnants of the magnificent forests that once solidly covered this area. These forests, in many cases, were slaughtered by the early settler in order to provide land for agricultural crops. They continued to be exploited in later years until we have arrived at the dangerous situation that was mentioned earlier in this paper.

The value placed on forest products from Ontario farms in 1931 amounted to almost fourteen million dollars which was 25 per cent of the total revenue received from the sale of all forest products.

A well-managed woodlot is a valuable asset to any farm. The woods will furnish, at all times, a convenient and economical supply of lumber, fuel and fence posts, telephone poles and maple syrup for home consumption. Larger woodlots occasionally produce a surplus of the above products which may be sold.

Farmers, to-day as never before, realize the value of a woodlot in supplying material for repair work around the farm. There is, however, a great temptation at present to mine the woodlot, with exceedingly high prices being offered for any quality of lumber. Such slashing of woodlots has, however, been curtailed in several counties in Ontario within the last year due to the passing of legislation which permits a county to pass a by-law regulating the cutting of woodlots on private land. At the present time (November 1st, 1947) ten counties have passed such by-laws, namely:

Elgin	Durham
Grey	Oxford
Huron	Perth
Middlesex	Waterloo
Norfolk	Wellington

A well-managed woodlot, besides supplying the various wood products, is also a valuable asset from the standpoint of conservation. The wooded area acts as a windbreak, bird sanctuary, and a sponge to absorb the melting snows and heavy rains, thus preventing erosion and acting as a reservoir for springs and wells. Woodlots enhance the beauty of the countryside and provide employment in the off-labour season.

The main problem in handling woodlots is not one of planting but of using sane silvicultural principles in cutting operations. If properly

handled and protected, they will restock naturally from seed. On areas where there are not sufficient trees growing naturally, it will be necessary to plant seedlings to fill up the gaps.

Woodlots should be protected from livestock, fire, insects, and fungous diseases. The ideal woodlot is one composed of a variety of valuable species of different age classes, and should be worked over regularly by making improvement cuttings and thinnings in accordance with a definite plan.

IMPROVEMENT OF STREAMS FOR FISH

Streams are classified as to size, amount and type of water and the present type of fish that inhabit them. It may be unwise to stock them with fish not native to the specific area. Speckled trout, for instance, will not live in as warm a water as brown trout. Brown trout are gluttonous cannibals and have been known to destroy or cause the speckled trout, native to the stream, to disappear when introduced into a natural speckled trout area. Larger, deeper streams or rivers with warmer waters produce species such as pike, pickerel, bass and maskinonge.

Settlement and agriculture have had an adverse effect on streams. Many streams through lack of water storage areas at their sources and along their tributaries, dry up completely during the summer. Other streams have been polluted by industrial waste, which make them uninhabitable by fish life.

The deforestation of watersheds and drainage of natural swamp reservoirs have resulted in excessive flooding and extreme erosion. This flooding and erosion transports soil from the cultivated fields, deforested areas and eroded banks into the stream bed, thus covering up rich food supplies and destroying the natural conditions required for normal growth of aquatic plants which provide directly or indirectly, fish food. Streams which are suitable for fish life should be protected by the conservation and improvement of natural storage areas such as swamps, and reforestation on the drainage areas of such streams to prevent silting. The banks also should be planted with willow and other trees to prevent ersoion and to provide shade for the streams. The stream itself could be improved by the placing of suitable obstructions or small dams to provide rest pools and other natural conditions for the species concerned.

The fish life of any stream is closely associated with the agricultural and forestry practices on the areas adjoining the stream and can be improved by the land owner through which the stream passes. A constant flow with the minimum of silting and pollution is imperative for successful fish culture.

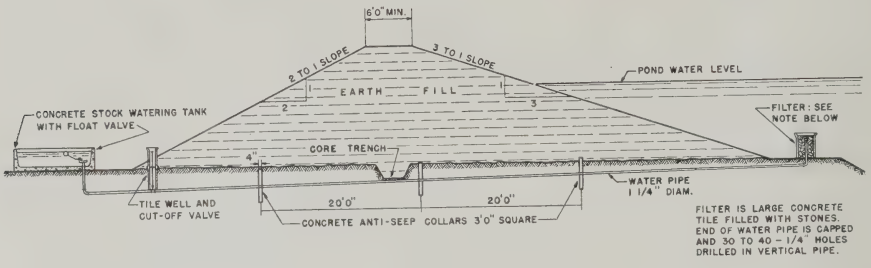
PROTECTION AND CARE OF NATURAL RESERVOIR AREAS

The preserving of natural reservoir areas such as swamps and marshes to maintain a constant stream flow and to supplement groundwater level is very desirable. These areas should not be pastured, and reforestation, where necessary, should be carried out intensively. It is folly to drain these areas as they are of more benefit to the country in their natural water-holding capacity. In some cases, small dams should be constructed to prevent excessive drainage during the spring or periods of heavy precipitation.

SMALL DAMS

Small dams are often built of concrete, rock, cribwork filled with rock and earth. The most common material used is earth and for a short paper such as this only the earth dam will be discussed.

However, no matter which material is used or how small the dam may be, it is very desirable that some form of outlet be placed in the dam so that it can be emptied for cleaning from time to time and also that it can be left open in the autumn so that flood waters may escape more readily in the spring. Moreover, if the outlet is of sufficient size it will also assist in cleaning out silt from the storage area which inevitably



CROSS SECTION
SHOWING WATER PIPE LINE CONSTRUCTION

EARTH DAM FOR FARM PONDS

will occur particularly if the dam is built in an agricultural area. Such outlets might be even a pipe or a square wooden box and if the dam is large enough to require it, an outlet structure either of concrete or wood should be made, with heavy plank or square timber for stop-logs.

Such an outlet structure especially on earth dams is absolutely necessary, because if the water at the time of flood or freshet overtops an earth dam it is sure to fail. It is not so essential on a cribwork or

Earth dams for farm ponds should have gentle slopes well covered with even, mowed turf. Steeper slopes erode requiring constant care and maintenance and woody growth leaves water passageways in the dam when the roots rot away.

rockfilled dam and is not necessary on one of concrete because in this case the whole concrete structure serves as a spillway. In planning the spillway and outlet it is also necessary to have a rough idea of the maximum amount of water which might come down the stream, in order that the spillway may be made large enough to take care of this. This is absolutely necessary in the case of an earth dam.

If there is any choice in the selection of the damsite it is preferable to choose a spot where the shoulders of the valley come together so that the dam can be as short as possible but at the same time impounds as much water as possible in the valley which fans out behind it.

In actual construction the first thing to do is to strip all the sod and brush or other debris from the whole damsite until the subsoil is exposed. This makes it possible for the earth which is used for the dam itself to bond itself securely with the base of the dam. Next, dig a trench four feet wide, the full length of the dam, narrowing the width a little if the dam is very low. If possible the trench should be dug down to impervious clay. This trench should then be filled with impervious clay laid down in 6-inch layers and packed by tamping or other means as each layer is laid on. The whole damsite should then be plowed with deep furrows lengthwise five feet apart to form an additional key for the new soil to the old. At this stage the outlet structure should be erected and the design of this would have to be in accordance with the size of the dam and the amount of flow, and some special assistance might be required for this part of the work. Next, the dam itself should be laid down, and the layers of earth preferably clay or near clay should be spread on the whole damsite in 6-inch layers and packed with a roller or some other means. The upstream slope should have a ratio of three to one and the downstream a slope of two to one. For a 10-foot dam the width at the top should be at least four feet and for lower dams the width can be decreased accordingly. The top of the whole dam, of course, should be perfectly level and should be three feet higher than the spillway or the top stoplogs for a 10-foot dam and a little less as the height of the dam decreases. Both slopes of the dam should either be sodded or seeded with grass to produce a good stiff turf but it is not advisable to plant trees of any kind on the dam itself. If the dam is being built where the

The construction of this inexpensive small earth dam in Albion township has created a miniature lake which provides fishing, boating and swimming facilities for the owner.

soil is sand and the transporting of clay would be excessive, a core of planks should be used. Two runs of two-inch planks, preferably cedar, well creosoted, should be stood on end one plank overlapping the other and both rows well spiked together. The earth fill should then be laid down on both sides of the core at the same time.

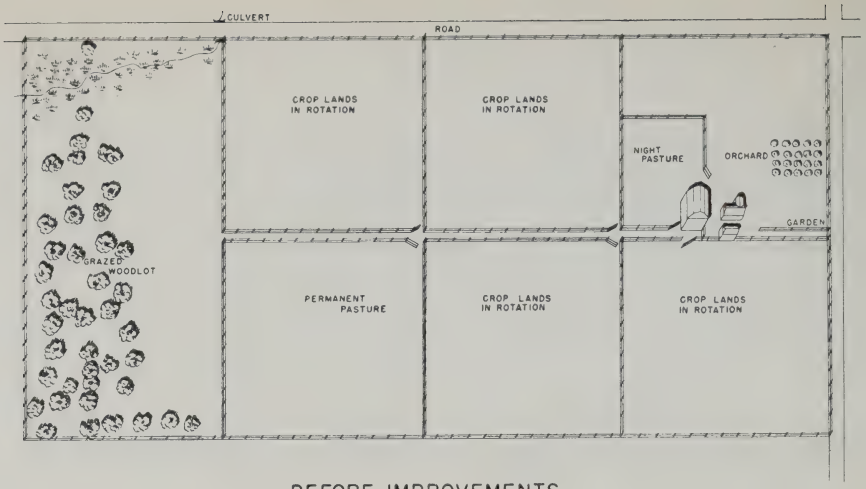
Before building a dam of any size in Ontario, particularly a dam which approaches ten feet in height, the owner should be sure he has cleared with the Surveyor General's Office of the Department of Lands and Forests because under the statutes of the Province it is not permitted to build a dam without first securing permission. If a design is submitted to the Surveyor General he will either give permission or make alterations so that the dam will be considered safe. The Act, of course, is intended to protect those living downstream from where the dam is erected because if the dam is not built sufficiently strongly, in the time of a heavy freshet,

A view of the lake created by the dam in the foregoing illustration. The owner has reforested part of the surrounding slopes to protect this water storage area.

or flood in the spring, the whole structure might fail and thereby cause much discomfort and loss of property lower down the valley.

FARM PONDS

By this is meant a small pond or catchbasin usually in a pasture field for the purpose of watering stock. Occasionally such a pond can be built on a small creek and, of course, if a small dam is erected as described in the foregoing section, this too can be used for stock as well as other purposes. In Western Canada this type of pond is usually called a dugout, and consists of removing a sufficient amount of earth in the low part of the pasture field or in a natural gulley and using the earth which is moved as a dyke or a small dam. Such ponds can only be built where the sub-soil is impervious or nearly so. With such small farm ponds it is desirable to plant a few trees such as Willow, Elm or Soft Maple around the edges and encourage the turf to grow right down to the water. If this is done it will be necessary to fence a small area around the pond. This will exclude cattle from the edges and not allow them to trample the soil and wallow in the pond itself. Also some means of filling a trough outside the fence will have to be installed. This may be a pump or a pipe with a fawcet through the dyke or dam. If such protection as the

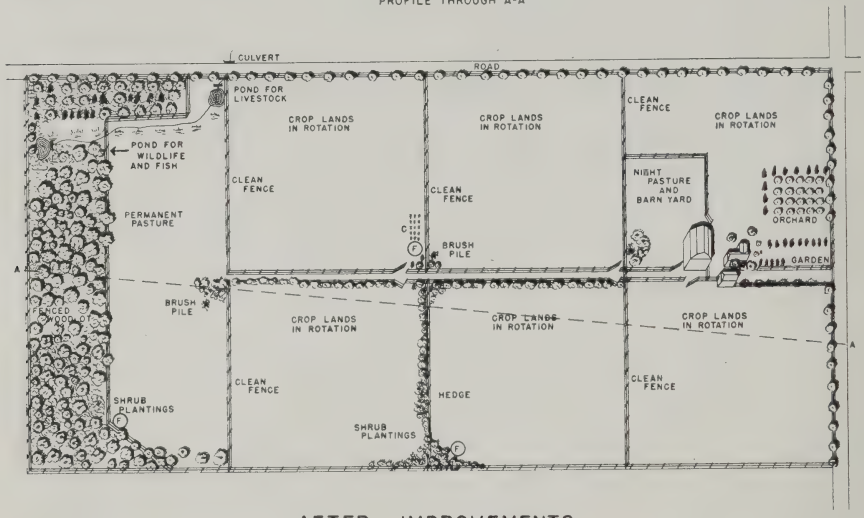


BEFORE IMPROVEMENTS

SHORTAGE OF COVER AND FOOD FOR WILDLIFE.

NO PONDS
GRAZED WOODS
NO NESTING SITES
NO WINTER FEEDING STATIONS

PROFILE THROUGH A-A



AFTER IMPROVEMENTS

COVER AND WILDLIFE FOOD PATCHES SUPPLIED.

FENCED UNGRAZED WOODLOT
PONDS
WINDBREAKS
BRUSHPILES
WINTER FEEDING STATIONS
GAME LANES (HEDGES)

LEGEND

TREES
LOW UNDERBRUSH
BRUSH PILE
SWAMPLAND
CHECK DAM WITH POND
FENCE
WINTER FEEDING STATIONS
CORN SHOCKS LEFT

above is given to the pond it can be made a beauty spot on the property as well as serving a very useful purpose.

If such a pond is sufficiently large—and again expert advice will have to be obtained on this—certain species of fish can be introduced. Furthermore such ponds can be fertilized to increase plant life suitable for fish food.

CONSERVATION FARMING

By conservation farming is meant improved methods of farming such as contour plowing, strip cropping, grassed waterways, terraces and other methods which enter into the control of water and soil erosion on the farm property. It is not the intention of the writer to elaborate on this important type of work for Southern Ontario. The actual carrying out of this programme is being handled by the Soils Department of the Ontario Agricultural College. However, the subject is mentioned here because in the case of men who are conducting farming on a large scale in the country, as many city men are now doing, there is a splendid opportunity for these so-called "gentleman farmers" to demonstrate this type of farming to smaller land owners around them. Much literature can be secured on the benefits of conservation farming and literally millions of farmers in the United States are carrying on this type of work at the present time. From these it has been proven beyond a doubt that such conservation farming increases the crop yield as much as 25 percent and in addition is easier on horses, and requires less gasoline for the tractor. Above all and more important, of course, is the fact that the soil itself is conserved and fields of gentle slope are not annually being eroded of their top soil.

Conservation farming, however, is something which cannot be entered into without serious thought and planning. As a matter of fact if the farm owner is planning to carry out such work he should make application to his nearest Agricultural Representative or the Soils Department at Guelph and secure advice on the proper planning of the fields which he wishes to put under this type of control. Furthermore, once the work is in progress or even before, and especially if he is going to impress his neighbours with the advantage of this type of work, a careful system of accounting should be carried out for a few years previous to conservation practices and certainly for a few years after the new method has been used.

GAME BIRDS AND WILDLIFE

The welfare of wildlife of any region depends upon an adequate supply of food as well as suitable cover. Virgin forests of pine have less game than more open-grown timber. The reasons are that game and bird life require herbaceous or shrubby vegetation for cover and food. It is true that there is some tree seed available in the fall, for food, but often

there are many years in which there is a complete seed failure. It is essential in any conservation scheme which hopes to bring back game birds, that consideration be given to planting a certain percent of the area with suitable shrubs and trees for bird food and shelter. Besides the woodlot border and shelterbelts, clumps of trees and wild shrubs should be planted at fence corners and other rough spots not suitable for cropping. These plantings could include a few of the following: Mountain Ash, Coralberry, Elder, Hawthorn, Hazel, Juniper, Nannyberry, Wild Plum, Sumac, etc. To obtain the maximum wildlife production, game areas must be distributed as uniformly as possible throughout the forested areas of the region under management. The wildlife indigenous to the region should be given first consideration and assisted to replenish itself. The indiscriminate use of artificially reared game birds, not native to the area, should be discouraged unless thoroughly tried out. The English Ring-Necked Pheasant, when reared artificially and introduced into Southern Ontario, has proven very satisfactory in many regions. It will not survive, although hardy as far as weather is concerned, where there is a continual heavy blanket of snow during the winter season. It must be able to obtain its food which consists mainly of grass seed, weed seed and grain.

The rearing of game birds for liberation requires considerable skill and experience. Those interested in raising game birds would be well advised to seek the advice of specialists in this work. There are many pheasant farms that make a livelihood from raising pheasants for the Division of Fish and Wildlife of the Department of Lands and Forests. For those who have the time, the raising of ornamental pheasants, game birds and peafowl is a very fascinating hobby.

CONCLUSION

In conclusion may it be said that this paper is not intended to be an exhaustive treatise on each subject covered. Rather it is intended to be thought-provoking because it must be realized that in an article as short as this it is impossible to do justice to the many items which have been covered. However, the subjects mentioned should at least arouse the curiosity of those who are interested in carrying out a conservation programme on their country property to the fullest extent. When the time arrives for the carrying out of one or more of these schemes, expert advice can be obtained from the different government departments.

DISCUSSION

MR. J. B. SMITH (Toronto): A good deal has been said about ponds. It bothers me. I have a feeling that if every farmer down the stream had a pond the warm water would be gradually coming up the stream, because unless the ponds were very well protected

the surface of these ponds would all become warm water, and therefore the streams would become warm—the warm water would be propelled toward the source of the stream all the time.

DR. F. P. IDE: I would say the point at which the dam is put in should be very carefully considered, and as far as speckled trout is concerned, the logical place would seem to be at the bottom of their normal range in the stream, and in that way you would give them sufficiently low temperatures to provide for good growth which is essential in getting sufficiently large size.

It is possible also to somewhat minimize the effect of that warming up by arranging for the outlet at the bottom of the pond, rather than at the top. Where you have an outlet at the bottom you have cold water and in that way you would preserve the condition downstream somewhat. That would require very careful planning.

EUROPE IS TELLING US

Watson H. Porter
Secretary of the Ontario Conservation and Reforestation Association

ONE day in June of this year I walked into an officers' mess in Bad Oeynhausen and straight into an argument.

Bad Oeynhausen is the headquarters of the British Army of Occupation in Germany and in the mess I found a young British officer arguing that food was scarce because so much of the land in Germany was covered with forest. Someone suggested that I might like to get into the argument; but I was there to observe not to correct. I felt the time at my disposal was much too brief a period for me to put things right in Germany and to solve the major problems for the four occupying armies. So I ducked in this manner:

I told them what I had read in Nora Wahn's book, "Reaching for the Stars", and how at one time the German people ruthlessly cut down their forests and cleared the land in order to grow more food. At last they found, however, that they were producing less food, not more. They had destroyed the balance and as a consequence they had thrown their production programme into reverse. They were wise enough to analyze the situation correctly and also wise enough to do the correct thing when they knew what the correct thing was.

Germans are like that!

Their worst mistakes have been made in military and political affairs when what they thought was right was proved to be tragically wrong.

I am not suggesting that we look to the German Reich for guidance in all things temporal and spiritual, and if you could see Germany now you would better appreciate the significance of these words.

I do suggest, however, that successive German governments and the German people have pursued a wise policy in respect to their forests. Wherever I travelled in Germany I saw the hillsides clothed with forests and the hilltops crowned with trees. Westphalia, which lies within the British zone of occupation, is rolling country and across it stretch three ranges of hills. Sometimes they are called the Westphalia Mountains. If we had those hills in this country they would be bare and probably eroding; not so in Germany. The lower levels are farmed, of course, but the upper slopes and the tops of the hills are heavily timbered.

It was a beautiful drive across Westphalia. The Autobahn (super highway) pierces the forests as it successively climbs to the mountain tops, and then past the height of land the traveller looks down upon broad fertile valleys with snug homesteads and green or well-cropped fields.

Managed forests on top of the Westphalia Hills in Germany are pierced by Autobahnen or super highways such as this.

It is mostly well grown timber that one sees in Germany. No doubt reforestation was carried on prior to the last war, but after Hitler's armies began to roll I doubt if much tree planting was done. Since the war ended it has been chaos in the Reich. The forests are the result of decisions reached many years ago—decisions followed by action; action supported by state policy.

Nowhere did I observe any slashing or indiscriminate cutting. Nowhere did I notice a swamp being cleared or a hillside unclothed.

Trees had been cut. I fancy the harvest has been an extensive one during the last ten years. The shortage of fuel has created a desperate situation, yet in spite of the tremendous need the trees are taken according to a state plan. Defective or prime trees are harvested. Healthy immature trees remain standing.

Even the present dire needs of the people are not sufficient to break down their respect for trees or to cause violations of their forest laws. In the town of Lubeckie, not far from Bad Oeynhausen, there is a huge hall where all the facts about Germany are collected and displayed. Among other things learned there I noticed that 27 per cent of all Germany is covered with tree growth—a total of 31,300,000 acres.

Whether that percentage of land under forest is necessary to create or restore the proper balance I do not know. If any less would have done I think the Germans would have been glad to use the land for food production.

In any case, the large percentage of forest growth was not the reason for the food shortage in the British zone. I knew, and the British officer should have known, that in the zoning of Germany, industrial areas were cut off from their natural food supplies and there has been very little movement of goods back and forth between the zones. The Ruhr, where eight million people live, is in the British zone and the bulk of their food formerly came from the east side of Germany now occupied by Russia.

International politics, not forests, are the underlying cause of food shortage in Germany.

For France I do not have the corresponding figures but there I observed the same principle and practices in force. France maintains a good percentage of the land under forest cover, and the state assumes responsibility for acreage and management.

It is really a pleasure to see the splendid forests scattered throughout heavily populated agricultural districts and one from this country cannot fail to notice how well they are managed and how carefully any cutting is done.

The Low Countries do not boast of their forestry, but in the Netherlands I made what to me was an interesting observation. In one large polder, or area of land reclaimed from the Zuider Zee, the Dutch had attempted to create a forest. This polder was flooded by the Germans as a defence measure and all the trees were destroyed.

It was significant that the Netherlands Government would think of forestry on land reclaimed from the sea at such enormous costs when always they face the problem of sustaining a population of nine million people on four million acres of land.

Denmark is forest conscious and now they say it will be 60 years before their forests recover from the effects of the war and the German occupation.

The foresters are now having a field day in Britain. Reforestation is going on apace and the present programme projects new forests covering five million acres of land. They already have splendid plantations in England and Scotland under state management, and a good policy of aid to individual property owners who maintain approved woodlots.

T. B. Manson, the Chief Land Officer on the Scottish Department of Agriculture, told me that he must be constantly on the alert to prevent the Forestry Department from taking land that is suitable grazing area

for blackface sheep. Apparently there is a healthy competition between the Department of Forestry and the Department of Agriculture and one can see the result of it on thousands and thousands of acres of young growing trees.

The foresters have even invaded the Highlands of Scotland and there they plant the steep hillsides up to an altitude of 1,000 feet. Beyond that they leave to the blackface sheep and the Scottish shepherds. I asked Mr. Manson if it was all spot planting on the hillsides in the Highlands.

"Yes," he said, "we plant in the up-turned sod."

"What is the annual precipitation here?" I asked him.

"Sixty inches," he said.

As a result of all the observations and interviews, only sketchily reviewed here, I have made two deductions.

The first is that a reasonable percentage of forest cover is vital to the well-being of the population in any country and it is a state responsibility to see that adequate forest cover is maintained. The second conclusion naturally springs from the first deduction, namely, that forestry should be a state enterprise. I am thoroughly convinced that until the state assumes full responsibility for our forest policies and programme in Old Ontario we shall make no progress commensurate with the needs.

I am not discouraging individual effort or municipal plantations, urban and rural. They are all good; they are essential. I am recommending that they be further encouraged; but we cannot make the required progress under the haphazard, hit-and-miss methods we have so far pursued.

The restoration of Old Ontario requires state planning and state action so our forest cover will be strategically located where it will beneficially affect the greatest number of people and provide the maximum control of soils and waters.

Europe is telling us how to act. And Europe is telling us to act now.

A DECADE OF CONSERVATION DEVELOPMENT

N. A. Fletcher

President Ontario Conservation and Reforestation Association

THIS is the tenth birthday of the O.C.R.A. so a brief review of developments in the last decade may not be inappropriate on this occasion. While the war interrupted progress, we need not be disappointed with the headway made, and we feel confident that a splendid foundation has been laid for aggressive action in the ten years ahead.

When the O.C.R.A. was organized in 1936-37 tree distribution in this province amounted to ten millions, and there were 5,000 applicants for trees. After three years of O.C.R.A. activities, nineteen million trees were distributed in one year to 10,000 applicants. The number of trees and the number of applicants doubled in those first three years.

Then came the war with all its anxiety and uncertainties, and our tree planting campaign went into reverse. The growing shortage of man power made it impracticable to urge large scale planting, so the O.C.R.A. joined with kindred organizations in planning for the post-war period.

Out of those deliberations came the Ganaraska Survey and the Ganaraska Report in which is laid down the technique of making conservation surveys.

Not long after, the Department of Planning and Development came into existence. The Minister and his officers quickly grasped the importance of conservation, and proceeded to promote it. Conservation conferences were conducted, this being the third of a splendid series.

Further surveys were undertaken, namely, on the Thames, the Humber and Etobicoke, and latterly on the South Nation River Watershed.

The Conservation Authorities Act was enacted at the last session of the Legislature, and three authorities have already been created.

The Trees Conservation Act was also enacted at the last session of the Legislature, and several county councils have passed the necessary by-law giving them power to control cutting within their county limits.

In the meantime, a Soils Department was created at the O.A.C. and conservation farming is already being demonstrated in Ontario.

The three provincial nursery stations have been enlarged during the last ten years, and now two new ones are under development, namely, at Kemptville, and at the Lake Head. In spite of this extension of the tree producing facilities of the province, we fear that the supply of trees in the next two or three years will be inadequate.

A couple of county provincial forests have been established since the O.C.R.A. came into being, and we look for a tremendous increase in municipal and private planting.

A promising development in recent years was the introduction of the system of District and Zone Foresters. They have been decidedly helpful, we welcome them and with their aid we can surely go further and faster.

The O.C.R.A. is not taking credit for all the developments that have taken place in the last ten years, but the O.C.R.A. has carried the flag, and it has been identified with every progressive conservation movement in Ontario in the last ten years.

We are proud of what has already been done, and with the continued co-operation of all conservation-minded people, we look forward to splendid achievements in the next ten years.

REGIONAL PLANNING

By F. G. Gardiner, K.C.
Warden, County of York,
Vice-Chairman, City Planning Board

THE Planning Board with which I have the honour to be associated is the Toronto and Suburban Planning Board, about which in the course of my observations I will have something to say.

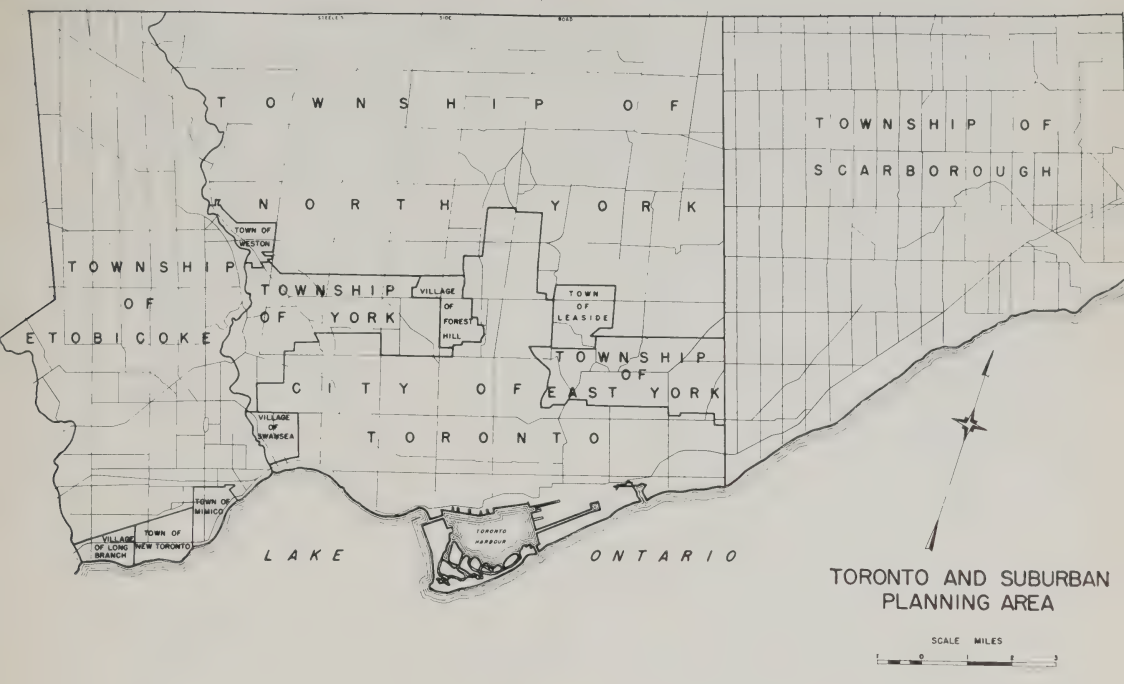
I have no technical qualifications which permit me to make any observations on soil conservation, erosion, reforestation, contour ploughing, or a lot of those things which you have been discussing. For a period of about ten or twelve years, however, I have been associated with the village of Forest Hill, and a member of the County Council of the County of York and I have heard many discussions during those years which have had to do with the various things with which you have been concerned here in your two-day conference.

I may find myself in the difficulty that, after having heard the speech made by the Prime Minister last night, he has already made some of the observations to you which I would like to have made, and if I appear to repeat what he has said it is just because the observations that he has made are observations that have impressed themselves upon me during the ten or twelve years I have been in municipal life.

One of those things is that planning and development is not new. There seems to be a feeling abroad that this is entirely a new invention, that planning is something that has arisen out of discussions about Postwar Planning.

One of the things that has resulted from our discussions about post-war reconstruction is the fact that you have here today a Conservation Conference that is crystallizing many of the ideas we had in mind when we thought there were certain things about which something had to be done in the post-war reconstruction period. But planning and development itself is as old as Greece and Rome and Paris and Berlin. It is not something about which we have just become suddenly conscious. It is not something which somebody has invented in the last few years. As a matter of fact, when we speak about Rome, there was very little in the way of planning until about the fourth century B.C. when the Gauls came down and sacked Rome, and finding much of the bad planning that had happened in previous years had been destroyed, they were able to go about their business and reconstruct and plan that great city in the fashion in which they did.

Similarly, we find to-day in Great Britain, as a result of the bombing that took place in those bad years of 1940, 1941, 1942 and 1943, that they are having an opportunity in that country to-day to replan the City of



London on a basis that I suppose never would have been undertaken if it hadn't been that a great portion of that city had been destroyed.

We, in this country, seem to have an apprehension and a fear about tearing anything down that already exists. We seem to be psychologically so attuned that it is impossible for us, for instance, to take a slum area and tear it down, because there happen to be buildings already there and we think we will be losing something if they are destroyed.

We seem to be critical of our forefathers. We criticize them for not having planned well. It seems to me that in the colonization days of this country and the formative years when the North American Continent was being expanded and built, those who built were going through a period when they didn't have any opportunities such as we have now to stand back and take a broad view of the situation and to visualize plans whereby we may improve that which we find around us. Our predecessors engaged, as they had to, in carving out an existence for themselves. Their time was occupied by building railways, building bridges, establishing coal mines, factories and warehouses, and when you are engaged in those pursuits you haven't very much time to lay out forests, playgrounds, recreational parks, or even roads, and particularly roads which would be sufficient to accommodate the millions of motor cars which had not yet been even invented at the time our municipalities, our province and our country were laid out and developed.

Therefore, it seems to me that the manner in which we should approach the task is not to criticize those who have gone before us because they didn't give us wide avenues, adequate parks and playgrounds, but to thank them for the opportunity which they have accorded us in this day and age and in this country of freedom and prosperity, an opportunity to assess now what ought to be done and an opportunity to carry it out.

It is of no advantage to discuss what went on yesterday. Yesterday is of no importance. To-day is almost gone and the only day that is of importance to us is to-morrow, and the days that follow. Therefore, we should take care to formulate and carry out plans which will not subject us to criticism fifty years hence from those who might be able to say that we lacked the imagination and courage necessary to carry out the plans we had an opportunity to implement.

In this respect it seems to me that the position which we occupy, particularly those of us who are elected representatives, is that of trustees for our taxpayers. There is an appropriate comparison between a municipality and an industrial corporation. Our shareholders in the municipal field are our taxpayers, just the same as shareholders in other fields, and it is they who provide the capital with which the industry, whatever it may be, operates. Our shareholders invest their taxes, and make an investment which we are here to administer, and the only dividend that we can give them is in service provided for them.

It is well to bear in mind in that respect that we frequently hear that this plan or that plan cannot be carried out on account of the financial consequences of attempting to implement it.

Now, with respect to planning, it seems to me there may be errors of omission equally as sinful as errors of commission, and, carrying the comparison between a municipality and an industrial or commercial corporation a step further, the Board of Directors, the elected representatives of the municipalities, may be just as well criticized for failure to make a good and sound investment as for having made a bad one, and we have plenty of evidence of the fallacy of not spending sufficient sums in the past for proper and adequate planning, omissions which have been just as costly as those where money has been expended and it has turned out to be a bad investment.

I realize at the same time that the public to-day is in a spending mood, and it is pretty difficult for a municipal representative to attempt to stop expenditures of money which may not be justified. It seems to me that all of these plans, no matter what they may be, whether plans for roads, for sewers, for community centres or for recreational parks, have to be judged from the point of view of the eventual benefits which they will give to our taxpayers.

TORONTO REGION

SHOWING PROPOSED GREEN BELTS AND METROPOLITAN AREA

SCALE OF MILES

5 0 5 10 15

INNER GREEN BELT — OUTER GREEN BELT — PROPOSED BOUNDARY OF GREATER TORONTO

There may be, as there sometimes are, entirely visionary projects proposed by those who, naturally, are very interested in them. Those projects are not related to something that is reasonable. They are not related to something which when accomplished will be a substantial benefit, not only to-day but to-morrow, and they have to be judged on the basis I have indicated, and you have to have the same courage to turn down those which are bad as to implement those which are good.

Now, having made those few preliminary remarks, perhaps I should say that I realize this as well, that there is no better time than the present to start curing those defects of the past which we are able to see. The subject on which I was asked to make some observations to-day is that of Regional Planning. They will be made particularly with respect to the situation as it prevails in the City of Toronto and its suburbs. In making those specific observations, I think you will see, those of you who are not especially interested in the City of Toronto and its suburbs, how the observations will apply to any large city which has a metropolitan area.

There are two planning boards in Toronto and district at the present time. One is what might be called a Regional Planning Board. That is the Toronto and Suburban Planning Board. Then there is what is called a subsidiary planning board, the one presently known as The Toronto Planning Board.

Before I make any further observations with respect to those two Boards, may I take this opportunity to compliment the City of Toronto

Board upon the very practical and comprehensive report recently issued by it with respect to the projects recommended in the City for immediate undertaking.

We are very much inclined to forget those men who render public service when their names are not before the public eye day after day. That original Board was composed of Mr. E. G. Partridge, who was the Chairman, and who is the President of the Goodyear Tire and Rubber Company; Professor E. R. Arthur, of the University of Toronto; W. C. MacBrien, Chairman of the Toronto Transportation Commission; C. J. Wolsey, Toronto and District Labour Council; F. D. Tolchard, General Manager of the Board of Trade; Donald M. Fleming, a Member of the City Council, and presently the Federal Member for the riding of Eglinton; and Mr. Tracy LeMay, Commissioner of Planning for the City of Toronto.

Those men engaged themselves over a period of about four years and produced the Greater Toronto Plan. Those gentlemen will find, and have found, I suppose, that a prophet is not honoured immediately in his own country. The plan which they produced has been subject to some criticism and some approval. What they endeavoured to do was a start for what now has to be done by a Regional Planning Board, and by the City of Toronto Planning Board. They laid out in the City of Toronto a series of arterial highways which could carry the large automobile and other traffic which exists within the borders of this city. They indicated where, in their opinion, green belts and parks should be established. They indicated where slum clearance areas existed and in many other recommendations prepared what is in my opinion a very comprehensive report for the planning of the City of Toronto from this day on.

Those gentlemen looked into the foreseeable future of the City of Toronto, to the day when the City of Toronto will have a population of about a million and a half in the city proper and its surrounding suburbs, when it will occupy an area of about two hundred and fifty square miles. They laid down plans which they have presented, with the idea in mind that the City of Toronto can't remain static, that it is bound to grow, that as the City of Toronto grows, its suburbs will continue to grow, and that the plans which now have to be laid are not sufficient if they are to be circumscribed only by the political boundaries of the City of Toronto, but must take in a much wider area.

One of the things which they immediately learned was that you can't provide a plan for a great city alone without being concerned with the land beyond its own boundaries. It has been said, and I think with some degree of correctness, that the big cities are beginning to decay at the core and are beginning to burst at the seams. The suburban municipalities are the seams, and we have to see to it that we do not stand in the way of progress.

A view of the Humber River in the proposed Outer Green Belt illustrating the type of site which should be open to the public for recreation and picnics.

In a metropolitan area where, in the city proper, there is a population of 700,000 immediately adjacent to a suburban area wherein the population is 250,000, the main problems of planning and development are of just as much importance to the suburban area as to the city itself.

When the previous Planning Board delivered its report it made the observation that a planning board having a wider sphere of activity than just the city itself was necessary. The next step was an obvious one.

When the Planning and Development Act was passed it gave power to the Minister to set up a planning authority for the whole or any part of a municipality or for one or more municipalities, and in exercising that jurisdiction the Minister called conferences of the City of Toronto and the suburban municipalities, and suggested that as planning and development could not be carried on for the City of Toronto alone or for the City of Toronto and its suburbs, unless there was a Regional Planning Board upon which both the City of Toronto and the suburban municipalities were represented. The representatives of the 12 suburban municipalities agreed with that view.

The Minister therefore set up the Regional Planning area, composed of the City of Toronto, the Township of Scarborough, the Township of East York, the town of Leaside, the Township of North York, the village of Forest Hill, the Township of York, the village of Swansea, the Township of Etobicoke, the town of Mimico, the town of New Toronto, the village of Long Branch, and the town of Weston.

The duties of that planning authority are to prepare a plan indicating land uses, i.e., which part of the area shall be designated for agricultural purposes, which part shall be designated as industrial areas, which part shall be commercial areas, and which part shall be designated as residential areas.

The Planning Board is also to consider the broad question of transportation. It shall consider and recommend with respect to a programme of sanitation, and also with respect to the establishment of green belts and parks.

Now, I assume that all of those who are here have had somewhat the same experience that I have had. When you come to discuss what land uses shall be, you go and take a physical look over the ground, see its geographical layout, and only when you proceed to do that do you begin to appreciate the magnitude of the problem from the point of view of planning and development in such an area as that which I have described.

We find in this area people are actually living in the Township of Scarborough on the east and working in New Toronto, which is fifteen or sixteen miles away, over on the other side. We find people living in Etobicoke and going to work in the Ford factory on the Danforth, travelling completely across the city. We find that in the area there has been a bad mixture of industrial and residential development, bad mixtures of commercial and residential development, and unless some co-ordinated and comprehensive plan is made for the whole of the area the difficulties that have arisen in the past are going to be repeated in the future.

If you don't expect to be criticized you should never accept appointment to a Planning Board because you will find, particularly where you have twelve suburban municipalities like those surrounding the City of Toronto, little jealousies occur—and not always little ones. Some are between the suburban municipalities themselves and others between them and the city.

Generally speaking, our Regional Planning Board has met with a reasonable degree of acceptance, and all the municipalities involved have appreciated that if progress is to be made there must be a spirit of co-operation between the whole of those thirteen municipalities.

In order to accomplish co-operation, the Minister has provided that there shall be an Advisory Committee. The Advisory Committee will

Several owners of estates along the Don have created artificial lakes which, in addition to enhancing the beauty of the property itself, serve as water storage areas which help to maintain the water table in the surrounding farm land.

have thirteen members. The Planning Board itself has nine members. Out of the nine members, five are appointed to represent the City of Toronto, and four to represent the suburban municipalities. With twelve suburban municipalities to be considered, some were a little disappointed when they did not have a direct representative on the Planning Board.

To overcome that difficulty and to insure that nothing of an arbitrary nature was proposed or implemented by the Planning Board, the Minister has appointed an Advisory Committee, composed of representatives of all of the thirteen municipalities. The theory is that as the Regional Planning Board proceeds with its work it will, from time to time, report to the Advisory Committee so that each member of the Advisory Committee may present the views of his local municipality.

The foundation of the whole plan is co-operation. It is intended to give direction to sound development over the whole area.

The personnel are distributed pretty well over the whole geographical area—agricultural, industrial and residential communities, and labour is represented so that you have on a nine-man board a pretty comprehensive geographic, as well as occupational representation.

No sooner had that Board been established than criticism was directed at it and the apostles of gloom said it couldn't succeed. That all those twelve little municipalities, particularly that smug little village of Forest Hill, would never co-operate with anybody because they are so jealous of their local autonomy that they wouldn't get on with anybody else. To those who criticize the Board from that point of view, let me say you will never get co-operation if there is going to be invective directed toward the Board. Nothing will blast the village of Forest Hill out of its appreciation of local autonomy, and I doubt if anything will blast any of the twelve municipalities out of what they regard as their democratic right to carry on their municipal administration in the names desired by their residents. I don't know whether it is humour or slander—but whichever it is, those who are responsible for it are driving nails into the coffin of any sane and reasonable town planning development around the City of Toronto.

I am one who says it can proceed on a basis of co-operation. We, the municipalities surrounding Toronto, can't stand in the way of progress. If you find yourself standing in the way of progress you will soon find that some force will arise which will not permit you to stand there too long. We can accomplish the obvious necessary planning on one of three bases; one is that the City of Toronto shall annex the whole area, which is highly unlikely, and they would have to annex the whole area before they could do the job because there would be no use annexing the village of Forest Hill and leaving the town of Leaside out, and you can't annex Swansea and leave out the southern part of North York.

Another basis is to establish what is commonly known as a metropolitan area, composed of twelve areas surrounding Toronto. That would have to be accomplished by some legislative authority. Which political party would have the temerity to perform that operation I don't know. I know one that would not. They would have to throw the twelve municipalities into one political area, which would take in from the Westhill in Scarborough to Long Branch in Etobicoke. They would have to say that the region surrounding the City of Toronto is going to be a metropolitan area and throw the whole bunch, lock, stock and barrel, into one Council.

The third and only alternative is some method of co-operation. I think we can get that co-operation if we proceed on sane and sensible lines. When a project comes up, which has a bearing on some particular municipality, we shall go and confer with that particular municipality with respect to it, we shall give due and proper consideration to the

A dam on the upper Don which should be maintained because of its aesthetic and water storage value.

representations which that municipality makes, and in the final analysis will find, if we follow that procedure, that we will get a degree of co-operation out of those discussions that you can't get in any other way.

We must bear in mind that we have to be patient. There is no object in flying off the handle and abusing somebody if they criticize you a little. Rome wasn't built in a day, and the Regional Planning Board won't develop a plan in a day. As long as there is no bureaucracy in respect to it, as long as there is no arbitrary power in respect to it, it seems we can in the Toronto and Suburban Planning Board accomplish the things that the original City of Toronto Planning Board found it could not accomplish until it had the co-operation of the suburban areas.

The great difficulty, as you will see from the observations I have already made, is that if there is a highway, for instance—they are the easiest things to describe—if there is an arterial highway going into the City of Toronto when it hits the City of Toronto border it has got

to go through the suburban municipalities. I suppose there is no difficulty in financing within the City of Toronto. They seem to be able to finance whatever they undertake. The moment it hits the border it runs into the suburban area, and the moment you hit the suburban area you haven't any political unit which can tax the people on a political unit basis for the benefit of that work which will be enjoyed not only by the particular municipality through which it goes but the whole suburban area.

What we have to do, as I see it, is this. We have to preserve for those municipalities their local autonomy. I realize there are two sides to that debate. The Citizens Research Bureau says that is an expensive and foolish way to handle it, that the borough system is a bad system because it is expensive, but you have to realize that, if you are going to be able to plan, perhaps you are not going to be able to do it on the basis of perfection, but only on the basis of practicability, and you must have, it seems to me, some political unit which will permit the financing of these undertakings once they pass the borders of the City of Toronto.

In the Province of Ontario there are some counties which are called United Counties. I think I am correct—there are the United Counties of Northumberland and Durham, and Dundas, Stormont and Glengarry, united for the purposes of carrying out their county municipal administration. There never has been a case yet, to my knowledge, where a county has been divided for the same purpose.

This is—perhaps it is revolutionary—the idea which I have at the present time. It seems to me that there is a natural division between that part of the County of York which is north of Steeles, and that part of the County of York which is south of Steeles. We call it in the County Council, the Mason-Dixon line; it is well established as being the dividing line between the north and the south. North of that line the development is essentially agricultural. The development south of that line is substantially urban.

Now, the advantages of such a division, in so far as planning and development is concerned, is that you would have a political unit established. It might be called the County of South York. In the County of South York you would have a political unit which would include every one of the twelve municipalities of which I have spoken from Scarborough on the east, to Etobicoke on the west. You could have a means of assessing that area for the cost, or its share of the cost of any development to be implemented.

There is already established a County of York Roads Commission, which is quite capable of carrying out plans with respect to 16 arterial highways.

With such a County of South York established you have a ready made, established assessment, and a means of taxing the people resident

within that area to provide the money for the constituent parts of a plan. With that system you would get over the difficulty of the jealousy of the twelve municipalities for local autonomy, because the twelve municipalities would still continue to exist. Each would have its own Fire Department, if it wanted it, its own Police Department, its own water works, or whatever it needed, and it would run its organization regarding matters which are local, but in the general plan they would have a means of financing any development.

There are other important reasons why the county should be divided, which are not related to planning and development. There is such a differentiation between the north half and the south half, that the day may have arrived when the two units might well be divided for the purpose of carrying on planning development.

That is all I have to say on the subject. I thank you for the invitation to address you. I compliment you and the other Chairman responsible for the successful conference which you have had, and I express the hope that you, ladies and gentlemen, will go back to the municipality from which you have come and that you will increase in numbers so that the interest in planning in your local municipality, individually, and as part of a more comprehensive area, may be given the benefit of your leadership and advice.

RECREATION ON FOREST LANDS

J. L. VanCamp
Extension Forester, Purdue University, Lafayette, Indiana

IT IS with a great deal of pleasure that I take part in this discussion of the land use possibilities inherent in the drainage areas of the Humber and Don Valleys. Many of my earliest recollections are centered around these rivers. Being raised on the east side of Riverdale Park, through which the Don flows as it nears Lake Ontario, I recall pleasant experiences ranging through every season of the year, and all connected with the out-of-doors recreation provided by that river valley.

Near where Sunnybrook Hospital is now located, was one of our favorite picnic grounds, a sheltered side valley which had almost its primeval character. In the springtime, this glade was alive with the beauty of the early flowers. In the autumn, the fun of scuffling through the dried leaves, and of searching for beech and hazel nuts was every boy's privilege. Wintertime was marked with the joys of coasting on home-made sleds, or later, by our first attempts at standing upright on skis. Many of these slopes looked long and hazardous to a small boy on his initial flight.

Later, the Humber Valley became the week-end and holiday focal point for our group. Canoe trips on the river remain among the most pleasant memories of the past. As the automobiles of that day, now a quarter of a century past, became more venturesome, they carried us north through King Township, to wiener roasts and steak fries in many a wooded or watered spot, ideal for the purpose.

These personal reminiscences serve the purpose of adding a sincere desire to see these places, and their counterparts, maintained and preserved. As a forester, I hope to see all lands properly used, but in addition there is the personal interest which arises from pleasant recollections of boyhood. All of us, I am sure, desire to see such enjoyable opportunities given to others fortunate enough to live in this same area.

In the Humber and Don Valleys, as in any area where heavy population pressure exists, the problem of land use is complicated by present ownership, land values, and taxing structures. Popular demands arise for various privileges and uses, and heavy demands are made on the lands for agriculture, timber production, or other uses such as minerals, clay, and gravel deposits. The process of change from the present situation which, in many cases, is not ideal, to a situation approaching true conservation, is one which will take the best concerted efforts of all interested agencies. In addition, the education of a very great many people is required, especially of those who have no background of biological knowledge to assist them in sympathetic understanding of these problems.

Recreation at Ferdinand Forest Lake, Indiana.

A basic and fundamental principle on which foresters operate is the principle of good land use. This is often defined as the best use of every acre for the greatest number of people in perpetuity. Than definition should embrace the outlook of the farm owner, bushlot owner, forester, engineer, or any civic or government official dealing with longtime plans for the use of land. With that concept in mind, and that plan in action, many of our present difficulties would not exist. Good land use works with nature and does not ask more of any piece of land that it is capable of sustaining, perpetually.

In the time granted to me to-day, I do not propose to solve any problems. The purpose of this meeting is, I believe, to awaken interest in the minds of the people concerned, and to consider the next steps for practical action. I will, therefore, attempt to bring you some examples of progress in land use in other areas, with special emphasis on two phases —one, Forest Land Recreation, and two, Public Education needed for proper use and appreciation of the out-of-doors.

This conference has heard many interesting papers on the problems involved in ideal watershed management. I am gratified to see careful studies of the existing situation being made, before action is undertaken by organized groups. The background for successful progress is accurate information. Such material is fortunately available, in part at least, from the early King Township survey, sponsored by Mr. Aubrey Davis in 1937. The more recent report by your Sub-Committee under the Chairmanship of Mr. McGillivray will be equally valuable.

In connection with the King Township survey, the field work was

done from King Creek farm, owned by my cousin, W. C. Harris of Toronto. This again puts a very personal complex on my interest in this matter. "Bill" Harris and myself, with my brothers, formed a group of youngsters who spent many happy hours exploring both the Don and the Humber. We shared the old swimming hole of those days, and absorbed all the wonderful nature lore which is available to any active and lively youngster who lives out-of-doors in unspoiled natural surroundings.

Getting to the specific topic of this paper, "Recreation on Forest Lands", I would like to make a distinction clear, at the outset, between the use of forest lands, and of park areas. Forest recreation is sometimes thought of as a by-product, but is better stated as a natural use of areas primarily devoted to the production of timber. Park areas, on the other hand, are designed primarily for people, with timber as one of several attractions for the public. In Indiana, which I will mention several times, this separation is emphasized by permitting no overnight camping in forests and by developing extensive hotel and group camping facilities is the parks. A sharp distinction between this forest and park approach to recreation should be kept in mind during the course of this discussion.

To illustrate some recreational possibilities, may I point out attempts which have been made to solve these problems elsewhere. One of the outstanding examples of far-sighted vision, in preparing for city recreation out-of-doors, is that provided by the Cook County Forest Preserve district, which surrounds the enormous and growing city of Chicago. On lands purchased many years ago, before the suburban developments had reached their present location, are preserved thirty-six thousand acres of woods, in a perimeter about the city. Outdoor recreation is thus made possible, at low expense, to millions of people from the Chicago area annually. Without the opportunities afforded by these nearby tracts, many people in downtown Chicago, especially those with low incomes, might be confined to the pavements or city parks all their lives.

While the Cook County district is called a forest preserve, the intense population pressure and the comparatively small acreage involved, classes this as primarily an area of park use. Most of the planning is concerned with the human angle. In fact, in recent years, the most pressing problem has been the need of educating the users of this area to the proper appreciation of the out-of-doors. This training is vital, to avoid much of the thoughtless and careless vandalism which otherwise occurs, where the public does not realize its personal share of ownership in these lands. As stated earlier, the subject of Conservation Education of the public and particularly how to behave out-of-doors, will be dealt with later in this paper, as a necessary phase of forest recreation.

As a further example of the use of wooded areas for public recreation there may be mentioned the Indiana State system of parks. These were originated many years ago by Colonel Richard Lieber, former Director of

the State Division of Parks at Indianapolis. Colonel Lieber had the vision to have preserved large acreage of wooded land in rough hill country, or that surrounding native scenic areas such as the sandstone canyons of western Indiana. Eight of the twelve popular parks in the system contain better than a thousand acres each, with the great bulk left in as nearly an untouched condition as possible. Recreation consists mainly of trail riding or hiking. Visitors to the parks have available the services of a highly efficient and well-trained staff of nature guides, who bring the interesting items to be found on any trail to the attention of the visitors. Well-staffed nature museums are found in several of the parks. Illustrated lectures by the park naturalists are given regularly throughout the summer season.

The chief factor in making the Indiana State Park system effective is a standard entrance fee established many years ago and rigidly maintained. The charge of 10 cents per head and 10 cents per car was asked of everyone visiting the state parks, with absolutely no exception. The governor of the state, or the head of the State Park system paid an entrance fee each time he entered one of the state park properties.

One very large source of income arose from the use of the Indiana Dunes State Park, just east of Chicago, where a magnificent sand beach on Lake Michigan attracted well over a million visitors annually, according to gate receipt records. This dune area also includes a large acreage of wooded land. Moving sand dunes have been reforested to prevent further encroachment on agricultural or residential land in the vicinity. The money received from the entrance fees has permitted the parks to maintain modern and well-supervised accommodations for the general public, good systems of roads, state park hotels, and the staff of nature guides and maintenance men required.

Michigan State Park lands near Detroit have received much publicity for some years. A recent development is the establishment of the Jefferson County Forest a few miles south of Louisville in the rough hill country of Kentucky. This county forest eventually will include 30,000 acres, to provide watershed cover, timber production, and an area suitable for extensive outdoor recreation for the population of Louisville and vicinity. The development is in charge of a graduate forester with experience in state and private management of timberlands, and a background of dealing with the public. The guiding spirit behind the movement is Mr. Tom Wallace, editor of the Louisville Times, a prominent figure in conservation in the midwestern United States.

Mr. Wallace's recent visit to the west coast, as a member of the National Conference on State Parks, gave rise to a series of newspaper articles. In one of these editorials Mr. Wallace draws the distinction between the heavily-used park area, and the county or state forest, where the recreation is provided by the maintenance of natural conditions.

Forest used for recreation and instruction. A class in forestry at the Conservation Camp in Versailles State Park, Indiana.

He quotes F. J. Adams, president of the Fontenelle Forest Association which has developed a tract of about 1,200 acres within a mile of the city of Omaha, Nebraska. This forest stretches southeast of the city along the Missouri River for three miles, and consists largely of wooded river bank land, which in that country is called "bluffs". The quotation follows: "There are no roads through the forest except one formerly used to reach the old Boy Scout camp. In addition to being a refuge for our rarest and most beautiful wild flowers, and to having native trees of every variety, it is also the habitat of as many species of birds as any locality in the United States. Because it has been kept in its natural state, the forest is invaluable to high school and college students and to others interested in trees, flowers, birds, and other wildlife.

"The intention of those who founded the Fontenelle Forest Association and the policy of the board of trustees who have carried on their work has been to maintain a virgin forest. They have endeavored to keep the forest untainted by 'civilization', or by 'development' or 'improvement', beyond making it safe and convenient for those who have the time, the energy, and the interest to travel the trails.

"The Fontenelle Forest is a photographer's and artist's paradise. For many years, the late Dr. Robert F. Gidler lived in his log cabin home and studio which was near by. Many of his well known paintings are of scenes in this forest."

Moderate flow in spring rainy season. Mill Creek, Indiana, near Greencastle.

Incidentally, this matter of the relation between the artist and the tourist industry, in rugged topography, is well worth noting. Tom Thomson and the group of seven, in Ontario, publicized Algonquin Park and the north long before the peak tourist rush. A. R. Fenwick, editor of Sylva, the house organ of the Ontario Department of Lands and Forests, is making good use of color reproductions of northern landscapes in publicity on forest recreation.

Again, bringing an example from Indiana, the Brown County unglaciated hill area, a heavily wooded land 40 miles south of Indianapolis, was early discovered by a group of artists led by T. E. Steele. The present Brown County Art Association with some of the most noted landscape painters in North America, is located in the county seat of Nashville. The local art museum draws visitors from all parts of the country during the summer months. Names such as Dale Bessire, T. Curry Bohn, and Will Vawter, to name but a few, command national respect in the world of art.

Following in the wake of these pioneer artists, and interested by the display of scenic beauty shown on their canvasses, a later wave of summer home residents gradually moved into this territory. Now the recreational trade, both summer and winter, brings in a high percentage of the cash income. Popular appreciation of the beauties of green, unburned hills, stretching out of sight in all directions, has resulted in the protection and natural reforestation of thousands of acres of land in this country. Otherwise it still might be in the poor, semi-denuded, eroded condition

which is common where agriculture is tried on land unsuited to cultivated crops.

I should mention a statement by John D. Coffman, fellow of the Society of American Foresters, and for many years chief forester of the National Park Service. Reporting on visitors to the national parks, he indicated that the *wooded* portions of the national parks account for many more visitors than any other area. The timbered tracts in the national parks are not managed as commercial forests, but the natural woods conditions are present. The woods themselves attract the major proportion of the tourist trade to the national park areas. This is an important factor to consider in connection with forest recreation, since it strikes a universal note of appreciation on the part of the general public over the entire North American continent. When several uses may thus be accomplished by the same practice, growing timber on suitable areas becomes an essential part of the conservation program.

Coming closer home, several county forests in Ontario are already beginning to show sufficient results to attract the public in growing numbers. I had the privilege of visiting the LaRose County Forest east of Ottawa in October this year in connection with the work of the Ontario Royal Commission on Forestry. The pine plantations on this area are now large enough to be the object of Sunday drives by visitors from 40 to 50 miles away. The total area in this county forest is already in the vicinity of 10,000 acres. Thirty thousand acres of this very poor type of agricultural soil are available for purchase and eventual reforestation either by natural means or by artificial planting. Other areas easily brought to mind are the Midhurst plantations administered by Mr. Adamson, and the areas around the Orono Nursery south of Peterborough. Both sections have suffered damage from bad land use, but are now in process of recovery. Pine plantations near the St. Williams Nursery on the north shore of Lake Erie are too well known for any comment on my part.

The second part of my paper deals with Conservation Education, which, although of prime importance, will be dealt with briefly. Being in educational work on natural resources, I have come to see the vital need of knowledge of good land use by the general public. Some older countries have achieved this stage, and are prospering. Parts of Bavaria, and Sweden, are notable examples of good forest management, as described recently by Robson Black, in Canadian "Forest and Outdoors". Other older countries have lacked resource management, and we have the sorry results scattered from the barren Mediterranean hills to the Yellow River floods of China.

One agency which deserves support by every person in this audience is the Canadian Nature magazine with headquarters in Toronto. This magazine, founded in 1939, in memory of Mabel Frances Whittemore, is

conducted as a non-commercial public service for the conservation education of the public. The very attractive publication entitled "Canadian Nature", published five times annually, expresses a feeling for the out-of-doors as well as any writing with which I am acquainted. Many supplementary booklets such as those on wild flowers, Canadian birds, ferns, general conservation, and nature activities are well worth investigating. Another excellent item is the series of Rural School Leaflets supervised by Dr. E. Laurence Palmer, of Cornell University, Ithaca, New York.

In my final reference to Indiana for to-day, may I report that Professor Howard H. Michaud, for 13 years Chief of the State Parks Naturalist Service has recently joined the staff of the Department of Forestry and Conservation at Purdue University. He will attempt to carry this same type of nature education to the youth of the state. He is responsible for programs of teacher training out-of-doors and for publication of bulletin material for the use of the schools.

In this connection, I take pleasure in asking this audience to accept copies of two publications recently issued by the Purdue Department of Forestry and Conservation, in cooperation with the Indiana State Superintendent of Public Instruction. These bulletins, which are on the table for your use as long as they last, are the first two in a series of simple manuals, for pupils in the 5th to 8th grades, and written in language suitable for that age group. These bulletins are provided free of charge, but are not suggested as a required course of study. They are, however, written in such form that they may be integrated by the teacher, either as lecture material or as field or laboratory exercises, in any course being taught in those grades. Applications are suggested in biology, science, civics, social studies, and geography. An alert teacher may make use of this natural resource material in many other courses as well.

I greatly appreciate the opportunity of sharing in this planning meeting to-day. I look forward confidently to seeing practical results of good land management in all of the watersheds in Ontario. You are fortunate in having the blueprints drawn by a capable Department of Planning. With a generation fully informed of the vital importance of land, forest, and water resources use, in conformity with natural laws, I trust to the energy and resolve of the people of Ontario to make the "desert" blossom as the rose. Still better, may we hope to see the pine and the maple leaf green and flourishing on our hills for all time to come.

DISCUSSION

MR. C. H. IRWIN (Carnarvon, Ontario): I would like to ask you how to go about this matter of education. There are a number of summer cottagers who collect all their tin cans, bottles, and so forth, from the cottage where they are staying until they come to a ditch where there are some shrubs, not thinking that as soon as the leaves are gone, all that is going to show. Some of our finest drives in Haliburton have been marred by all the ditches along the roadside being filled here and there by cartons of people's rubbish.

I think it is going to take quite a bit of education to change that. Those are people who are spending their summers in some cases, year after year, in that country. They don't come back in the fall. We have talked of having local garbage pits and so forth but some of us don't think they would take the bother to go to those pits to get rid of such debris.

PROFESSOR J. L. VAN CAMP: I think I would re-emphasize the fact we are not attempting to make sudden changes in people's habits. It just doesn't work that way. Maybe we are better that way. We think the next generation should know better than the parents and we are attempting to educate rather than expecting people to have their habits changed at the present time.

Maybe that is pessimistic, but we are looking to the younger group in that respect.

MISS L. J. PAYNE (Toronto): May I ask where these guides and leaders in the parks come from, and how they are trained?

PROFESSOR J. L. VAN CAMP: Most of these people are graduates of Sociology of some University, and usually have majored or specialized in Physical Culture, Games, or one of the sciences. Then they are given a Park Naturalist Training Course for about six weeks before they are actually given charge of groups or classes in the park.

It takes several years before one is qualified to answer many of the questions in the natural science.

QUESTION: Is it part time?

PROFESSOR J. L. VAN CAMP: It is usually part time with the exception of one or two employees who are looking after the museum and the museum exhibitions in the winter months. These are folks who teach biology or some other subject during the season.

In other words, they get some in-service training during the winter, being either biology or natural science teachers.

MR. H. GRIGGS (Mimico, Ont.): What is the advisability, where you have county reforestation areas, of opening them up for just such purposes as Professor Van Camp has indicated? The one problem I was thinking of during his address was the fire hazard. I have asked him that personally, but I think the answer he gave me would be of interest to those other delegates who are here, particularly those that are representatives of various counties in different parts of Ontario. I would like him to take a moment and repeat that answer for the benefit of everyone.

PROFESSOR J. L. VAN CAMP: The question is, how can you avoid fire injury or fire danger with the large public use, particularly of the county forests, which are probably largely pine plantation which are more susceptible to fire, probably, than native timber.

We have had a number of areas developed which started out as pine plantations on sandy land, and had to take some precautions against fire, primarily by making what we call fire lines, but disguised under the appearance of either riding trails or hiking trails, so it isn't obviously one of the fire lanes. They are not built north and south, or east and west but usually on the contour and kept on sandy ground.

But the hazard is less than one would expect, particularly if the public gets the habit of coming back to the area. It takes a proprietary interest in the territory. People think it is their wood, their forest, and you probably would be surprised how little damage there is in state forest areas. Most of the fires that have caused trouble have been on adjacent land where people haven't yet learned and are careless. Fires are spread from private lands into public property. We don't worry as much about the park property as some of the unorganized areas outside.

That is a partial answer. I think perhaps the fire prevention authorities would give more detail.

CHAIRMAN BAKER: It has been suggested to me that certain types of epidemic, whether insects or disease, or something else, or something like fire, tend to race through a uniform type of growth, and if it were all pine, the whole pine grove goes. Are we on the right track planting stands of uniform type of growth, or should we have some variety, so there would be a fire break by mixing those?

PROFESSOR J. L. VAN CAMP: We are forced into the planting of pine as most of the Foresters know. We would much rather see a hard maple or oak bush established, but the trouble is you don't have the same soil they grew in eighty years ago. You are probably down a foot and a half into the subsoil now, so while you are on the same county or lot, you are not planting on the same ground, and you have to plant a very hardy species on the poor soil remaining, and gradually develop back to the mixed bush.

So the pine is a necessity, and not one of the things with which we are obsessed. We are often accused of being pine crazy. It is straight trial and error—that is all that will grow, and so we recommend it.

Such things as white pine blister, rust, have to be controlled by the removal of black currant and gooseberry bushes. But in general if you can get back to fairly green conditions, disease and insect conditions practically take care of themselves in the forest. There were no great epidemics in the natural forests, because biological controls were present.

So while there may be some trouble during the transition stage, once you get back to general conditions, you have nature more or less in control of the general situation.

RECREATION ON THE HUMBER

K. M. Mayall
Department of Planning and Development

While the subject matter of this paper has special reference to recreation on the Humber River Watershed, it may be considered in a much broader aspect as applying to any watershed or rural area in Southern Ontario. In other words the facts put forth have a general application while at the same time the Humber is used as the specific example.

The planning of public recreational facilities in Ontario up to the present has been chiefly directed towards two ends, namely, facilities such as parks and playgrounds within the boundaries of cities and towns, and facilities for long and comparatively expensive vacations in wilderness regions relatively far from the industrial and agricultural areas of the province. The growing concentration of the population in industrial areas has greatly overtaxed the local facilities, while the time and cost involved in reaching wilderness areas has prevented the average family or group from visiting such areas more than once or twice a year.

It is now well recognized that a third type of facility has been neglected, namely public areas, both large and small, within a few miles of the agricultural or city worker's home. This lack of good recreational facilities close to the cities has been an obstacle to the enjoyment of healthy out of door activities and relaxation.

In considering this problem, three points must be kept in mind; first, the retaining and protection of natural advantages, second, the development of adequate facilities in maximum variety available to all people no matter what their age, occupation, or income may be, and third, the adjustment of these recreation plans to other conservation measures such as flood control, land improvement, and good forestry practices. The problem deserves serious thought on the part of all public spirited citizens when it is remembered that with a population of nearly a million people in the metropolitan area of Toronto it is difficult to find, within forty or fifty miles, except in municipal areas, a single public property dedicated to recreation. This is a serious condition when it is recalled that the dominant population of Southern Ontario consists of city dwellers.

If there is one material thing that every Canadian city dweller wants more than anything else, it is a small cottage on a lake or river where he and his family and friends can relax for a few hours or days from the tension and nervous excitement of city life and work. At present, this is not possible for the vast majority. The alternative is to provide public

but uncrowded recreational areas close to the cities. The types of recreation commonly considered vary from facilities for those who want only to get away from the dust and noise of highways and rest in pleasant surroundings and enjoy passive recreation, to facilities for active recreation such as hiking, aquatics and similar strenuous sports.

To fill this need there should be within easy driving distance of Toronto and other centres several scenic drives, roadside picnic sites with parking facilities and permanent fireplaces, trails for hiking and nature study, beaches with unpolluted water for swimming and water sports, wading beaches for small children, boating areas including public wharfs, fishing areas stocked with fish, hunting areas stocked with game, historic sites well marked, parks for group picnics including level play areas, and areas adapted to winter sports.

Another requirement though a less urgent one is the acquiring, in selected regions, of a small section of country as nearly as possible in its primeval condition. Nowadays that is difficult. There is also no reason why recreation areas should not be of educational value. For instance erosion control demonstrations, examples of good land practices and good forestry are of great interest to the general public and could be incorporated on the edges of such areas.

The increasing interest which the public is taking in recreational facilities is indicated by the rapid growth of such organizations as the Youth Hostels Association, a non-profit group who now have branches in 24 countries including Canada. Its sponsors organize clean and well supervised sleeping quarters available for a small fee so that hikers, cyclists and skiers may enjoy travelling in the open country under their own power. The hostels are in chains some ten to twenty miles apart. This group has an advisory council composed of men and women prominent in education and public affairs. It does not cater to those who travel by car.

Many of these facilities mentioned can be combined in one area. They should also be integrated in a broader plan for the zoning of land for health and recreation. The most advanced type of this zoning of land on a large scale involves the setting up of Green Belts. These are areas surrounding cities, which are set apart and restricted to agriculture and recreation. Such areas may include golf courses, airports, parks, rivers, lakes and playing grounds, in fact any suitable area which can be prevented from sale for real estate or industrial purposes. Since Green Belts involve Municipal Planning Boards as well as Conservation Authorities and since the planning of both groups here overlaps it should be done jointly. We are perhaps a little late in this matter in Ontario because many cities in Europe and the United States have long since

Fishing on the upper reaches of the Humber.

established green belts (the Green Belt Act became Law in England in 1938) but it should be pointed out in this connection that The Planning Board of the City of Toronto included the establishing of such green belts in its master plan of 1943, recognizing as it did the importance of such areas for the health and happiness of all those living in or near large urban centres.

Transportation to recreational areas is still a serious difficulty, because it is a fact that those who need recreational areas most, namely the underpriviliged, are also the least able to pay for transportation and do not have cars. However, it is interesting to note that there are this year 138,000 passenger cars in working condition in the county of York alone which indicates that there would be no lack of customers for new recreation sites if and when they are developed.

A good example of the type of recreation facility recommended for the Humber area is found on the Muskingum Watershed in the State of Ohio. This project which embraces about a fifth of the whole state was begun primarily to prevent floods, but has now blossomed into a combined programme of improved land use, flood control, better and more forests, wildlife conservation and recreation. There it is interesting to find that after part of the initial cost of dams and other improvements had been made, the Conservation Authority was obtaining a large share of its income from recreation concessions. They were charging a twenty per cent commission to those who wanted to set up concessions for boat rentals, food sales, overnight or weeky cabins, and camping facilities on the improvements which they had made, to the mutual advantage of all. The recreational facilities on the Muskingum are made use of by more than one million people annually. This example is cited not to emphasize the income from recreational facilities in a broad conservation development because the chief profit is the health and happiness of our citizens, but it does show that multiple conservation projects are not a pleasant dream. They are in practice in other countries and can be practiced here. Furthermore, they are not a monetary burden on the community but yield tangible returns as well as intangible.

Now, to be more specific, let us consider some of the problems that face the recreation planner on the Humber River. Let us look for recreation sites on the watershed. Since the land in the southern part tends to be flat and in no way spectacular, interest is naturally focused on the Lake Ontario shore and on the river valleys.

So far as the shore lots on Lake Ontario are concerned, they are entirely built on or privately owned from Sunnyside to Oakville and beyond. The lake temperatures in any case discourage swimmers. There

Hiking on the Humber.

are fourteen smaller lakes worthy of the name on the watershed. All are privately owned or built upon with the exception of two, namely, Scott Lake and Wilcox Lake on which there are very limited facilities for picnicing even provided the fee is paid. This brings us to the river itself.

It would take too long to give a detailed survey of all the river conditions, but from the point of view of recreation the situation is as follows. There are four prominent service club camps established on the river, two riding stables, two dude ranches, five golf clubs, two of which are private. There are several trout fishing clubs, all private, and two fair grounds within municipal boundaries, each with a ball park. But there are no camping grounds open to all comers, no picnic grounds in public ownership, no nature trails, no provincial or county parks and no specially planned scenic drives excepting the one below Lambton Mills.

There are no wildlife sanctuaries outside the built-up areas, even the swimming holes are now few and far between, no forest reserves other than 35 acres planted by Peel County, no notices which say to the residents of Toronto and the neighbouring towns and villages "You are welcome to picnic here, but do not destroy the flowers and the trees."

More open air fire places such as this one at Bolton Camp are needed on the Humber.

On the contrary there are innumerable notices which say "Private", "No Fishing", "No Hunting", "No Picnicing", "Trespassers will be Prosecuted", "No Camping", in short "Keep Out". This is the present contribution of the beautiful Humber River to the recreation of a community of nearly a million people through which it passes. It is now almost impossible to find a picnic site along the river, without trespassing on someone's property.

Many of the properties along the river have already been posted against trespassers. There is little doubt that every lot from the mouth

to the source of the permanent waters of the Humber has also been examined by real estate agencies, with a view to its disposal to private purchasers. The result is that the land along the river has skyrocketed in value.

Then there is the condition of the river itself. There is serious pollution affecting the whole main Humber for swimming purposes at least as far up as Woodbridge. There is even more serious pollution, affecting fish life, in Black Creek, which carries treated and sometimes untreated sewage, and also in a large tributary which has the misfortune to pass a large dye works in its course. The oxygen content in that tributary is as low as 2% which is very far below the point at which rivers begin to smell. However, with these two exceptions and one other, for a river which passes so close to a large city the Humber is unbelievably clean. It is very unusual for a city of like size to affect a river so little. Practically no industrial waste enters the river. But this is accidental and it is all the more reason why there is the greatest urgency in correcting the present abuses and preventing any possible further pollution.

Another serious problem which demands immediate solution is the fact that almost all of the west branch and many other tributaries dry up completely in summer leaving only unsightly standing pools to mark the river channel. At the same time the floods which have increased in frequency and severity have caused considerable bank erosion.

And now you will ask, "What is the solution?" Well, there is no simple solution. Only the method of trial and error will tell us exactly what we need. The area has been examined for possible recreation sites which should be acquired. There are many both large and small. They require improvements such as parking facilities, tree planting for shade and wildlife improvement, and in some cases the importing of sand for small beaches. More than 20 possible sites for dams have been selected and surveyed which would provide flood control as well as permanent lakes for recreation. While there is some speckled trout water and water that can be improved for speckled trout, and some brown trout water, the majority of streams drain extensive areas of mainly open farm lands and even with protection of banks will be warm in summer. They may best be used for the production of introduced fish adapted to the changed habitat, such as the Calico Bass and Large Mouthed Black Bass. We have extensive experience of similar treatment of similar waters just south of the border. Of upland game birds no census has been made in this area since there are practically none. Their increase is a matter of environmental control, improvement of shelter and winter feeding and so on. Other wildlife would respond rapidly to the improved environment which is planned, and which will include besides reforestation,

A Suitable Camp and Picnic Site on the Humber

wildlife food patches and farm ponds. The most urgent problem is that of ownership. Unless the necessary lands are acquired soon they will cost the public more in reparation to those who acquire and improve them for their own purposes. Speed is therefore essential. Another important point to remember is that what is planned now should be part of a regional plan of even larger scope, and we should visualize a Toronto of the future of many more than a million people with several hundred thousand living outside the inner green belt proposed by the City Planning Board. It may then be necessary for the lands along the Niagara escarpment, together with part of the interlobate moraine from Mono Mills to Wilcox Lake to be classed as a rural green belt and restricted accordingly. This would not affect its value and use as well managed agricultural and forest land.

Humber River at the Scarlet Road Bridge

The Humber River's present contribution to recreation needs may be summarized as follows: few if any sites developed for the recreation of the average family; many sites developed for expensive recreation such as summer homes and fishing clubs; and a few camps for the underprivileged. Of the latter the Bolton Camp of the Neighbourhood Workers Organization is not only the widest in its scope but also is probably the best example of cooperative achievement in recreation planning in Canada. Nevertheless its directors would probably agree that their work is not the final answer to the problem of public recreation. It is a magnificent enterprise but it is a palliative and not a cure.

The Humber Valley Watershed provides a splendid opportunity for multiple use planning including agriculture, forestry, flood control, wild life and especially recreation by all the people living in the valley. Such planning can now be accomplished with the assistance of the Department of Planning and Development and brought into fruition under The Conservation Authorities Act by the people whose interests such a program would best serve.

RESOLUTIONS

Passed at the Conference on Conservation held by The Department of Planning and Development at Toronto, November 29th-30th, 1946.

1. WHEREAS: The experience of the Canadian Government during the war provided ample evidence of the value of motion pictures for the dissemination of ideas and whereas visual education gives evidence of being the most effective means of selling the idea of conservation farming,

   THEREFORE BE IT RESOLVED that this conference recommend to the Department of Planning and Development the production of distinctively Ontario films on this subject as rapidly as the development of projects may present suitable subject matter.

2. WHEREAS: The Toronto Planning Board has made definite recommendations for the formation of an Inner Green Belt,
   AND WHEREAS delay in carrying out these recommendations will be costly,

   AND WHEREAS this area is already greatly in use as a recreational area, and future needs for recreational facilities will be even greater,

   THEREFORE BE IT RESOLVED that the Toronto and Suburban Planning Board be requested to take immediate steps to establish the Inner Green Belt as so recommended.

3. WHEREAS: The Toronto Planning Board has made definite recommendations for the formation of a Regional Green Belt,

   THERELFORE BE IT RESOLVED that the Provincial Government be urged to initiate immediate action in connection with the proposed Regional Green Belt and to develop it as a beginning of a Provincial Parks System in Southern Ontario.

4. WHEREAS: Certain residents of the Don Valley are already interested in initiating Conservation Measures in that Valley,

   AND WHEREAS the development of the Don Valley is closely interrelated with that of the Humber Valley,

THEREFORE BE IT RESOLVED that the Department of Planning and Development be requested to make a survey of the Don River Watershed.

5. WHEREAS: A survey of the Humber River Watershed has been completed by the Department of Planning and Development, and this survey has shown the need of conservation measures within that Watershed,

   AND WHEREAS similar conditions are known to exist in the Don River Watershed,

   AND WHEREAS the development of both watersheds should be carried on under a co-ordinated plan,

   THEREFORE BE IT RESOLVED that the municipalities embracing the Humber and Don River Watersheds be urged to request the Minister of Public Works of Ontario to call a meeting of municipal representatives with a view to the formation of a Conservation Authority for both watersheds under The Conservation Authorities Act, 1946.

6. RESOLVED: That the Department of Planning and Development be requested to publish a report of the proceedings of this conference.

7. That this conference stresses the importance of public education and the co-operation of all public bodies and organizations concerned in effecting conservation measures.

8. RESOLVED: That this conference express its thanks to Mr. E. W. Baker and the Community Councils Co-Ordinating Committee of Toronto and District for initiating the calling of the conference, to the Honourable Dana Porter and to Mr. A. H. Richardson and their colleagues of the Department of Planning and Development for organizing the conference, to the Honourable George A. Drew for his address of encouragement, and to the speakers who addressed the two-day session.

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